Essays on Transparent IT Support for Asymmetric Client-Advisor Encounters

The Case of Swiss Investment Advisory Services

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The Faculty of Economics, Business Administration and Information Technology of the University of Zurich herewith permits the publication of the aforementioned dissertation without expressing any opinion on the views contained therein.

Zurich, August 2012

The Vice Dean of the Academic Program in Informatics:
Prof. Dr. Harald C. Gall

To Sarah

Abstract

Investment advisory encounters are strained by information, knowledge and interest asymmetries between client and advisor. These are detrimental to advisory quality and client satisfaction, leading to an unfavorable client perception of investment advisory services. This situation is disadvantageous for both clients and financial service providers. Clients increasingly turn to other information sources and fail to reap advisory services' potential benefits for their investment decisions; financial service providers fail to exploit personalized advisory services as one the most promising differentiation strategies against competitors and struggle with low client satisfaction and retention.

This dissertation suggests a novel approach for these issues: addressing asymmetries in investment advisory encounters with transparent, shared IT artifacts. Hence, it is based on the following thesis: *Shared collaborative IT artifacts are a feasible and useful means to improve transparency of investment advisory encounters and, thus, to increase client satisfaction.*

The dissertation supports this thesis along three research essays: Essay I provides an empirical investigation of the status quo of Swiss investment advisory services. It suggests that investment advisory encounters are asymmetric and affected by a lack of *transparency* regarding the process and its information, leading to poor advisory quality and low *client satisfaction*. To overcome these issues, the dissertation introduces the solution approach of *shared collaborative IT artifacts*. While Essay I presents the basic building blocks of such an approach, Essay II and III demonstrate the *feasibility* of addressing process, information and cost transparency with such artifacts, presenting their underlying design considerations as well as their prototypical implementations. Furthermore, they provide experimental evidence of such artifacts' *usefulness* – results show that the constructed shared collaborative IT artifacts indeed are useful means to improve transparency in investment advisory encounters; they also demonstrate that providing such artifacts relates to increased client satisfaction compared to traditional investment advisory encounters.

Zusammenfassung

Gespräche zur Anlageberatung zwischen Beratern und Kunden sind durch Asymmetrien geprägt, welche sich in Unterschieden der Akteure bezüglich der verfügbaren Informationen, vorhandenem Wissen und verfolgten Interessen zeigen. Diese Ungleichheiten können zu einer unvorteilhaften Kundenwahrnehmung der Beratungsdienstleistung führen, welche sich insbesondere in gering wahrgenommener Transparenz über Beratungsabläufe und –informationen äußert. Dies wiederum kann sich negativ auf die empfundene Beratungsqualität und Kundenzufriedenheit auswirken. Es zeigt sich, dass diese Situation für Kunden wie Finanzdienstleister nachteilig ist: während erstere sich zur Informationsbeschaffung vermehrt anderen Informationsquellen zuwenden, lassen Finanzdienstleister das Potential ungenutzt, sich über qualitativ hochwertigere Beratungsleistungen gegenüber den Mitbewerbern zu differenzieren.

Die vorliegende Arbeit untersucht den neuartigen Ansatz, Probleme der Asymmetrie in Anlageberatungsgesprächen mit transparenter, geteilter Informationstechnologie (IT) zu begegnen. Sie stützt sich dabei auf folgende These: *Geteilte, kooperative IT-Systeme sind praktikabel und nützlich, die Transparenz von Anlageberatungsgesprächen zu verbessern und dadurch die Kundenzufriedenheit zu erhöhen.*

Diese These wird entlang dreier Essays gestützt: Das erste Essay untersucht mit empirischen Mitteln den Status quo Schweizer Anlageberatungsdienstleistungen. Aus den Erhebungen wird abgeleitet, dass Anlageberatungsgespräche eine geringe *Transparenz* bezüglich des Beratungsprozesses und der ausgetauschten Informationen aufweisen; dies kann die Beratungsqualität und die *Kundenzufriedenheit* beeinträchtigen. Um diese Probleme zu adressieren, präsentiert die Arbeit einen Lösungsansatz basierend auf *geteilten, kooperativen IT-Systemen*. Während Essay I die Bausteine des Ansatzes skizziert, zeigen Essay II und III die *Praktikabilität* solcher Systeme anhand prototypischer Entwicklungen, welche die Transparenz des Beratungsprozesses und der ausgetauschten Informationen – insbesondere auch bezüglich Kosten – adressieren. Die Essays präsentieren dabei auch experimentelle Nachweise der *Nützlichkeit* solcher Systeme. Die Resultate zeigen, dass geteilte, kooperative Systeme in der Tat nützliche Mittel darstellen, die Transparenz in Anlageberatungsgesprächen zu erhöhen; ebenfalls legen die Evaluationsergebnisse dar, dass die Nutzung

solcher Systeme die Kundenzufriedenheit im Vergleich zu traditionellen Anlageberatungssituationen erhöhen kann.

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„Ein Abschied schmerzt immer, auch wenn man sich
schon lange darauf freut.“

- Arthur Schnitzler, *Beziehungen und Einsamkeiten*

During the last four years, I had to play many different roles – team member, project leader, teacher, supervisor, student as well as colleague and friend. While I was not able to fulfill these roles in equal shares at all times, my environment provided me with plenty of opportunities to play each one of them.

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1 Introduction

Investment advisory encounters are strained by information, knowledge and interest asymmetries between client and advisor. These are detrimental to advisory quality and client satisfaction, leading to an unfavorable client perception of investment advisory services. This situation is disadvantageous for both clients and financial service providers. Clients increasingly turn to other information sources and fail to reap advisory services' potential benefits for their investment decisions; FSPs fail to exploit personalized advisory services as one the most promising differentiation strategies against competitors and struggle with low client satisfaction and retention.
This dissertation suggests a novel approach to counteract these issues: addressing asymmetries in investment advisory encounters with shared, collaborative IT artifacts transparently mediating the client-advisor interaction. Thus, the underlying main thesis of this dissertation reads as follows:

> *Shared collaborative IT artifacts are a feasible and useful means to improve transparency of investment advisory encounters and, thus, to increase client satisfaction.*

The dissertation seeks to support this thesis along three research essays. The essays are tightly connected to the thesis: Essay I provides an empirical account of the asymmetric nature of investment advisory encounters, their prevailing transparency issues and the resulting low client satisfaction; Essay II and III demonstrate the feasibility of addressing different aspects of transparency with shared collaborative IT artifacts by providing design considerations and showing their prototypical implementation; they also provide experimental evidence of their usefulness in increasing transparency and client satisfaction.
We shall commence by presenting the context of this research (next section). In Section 1.2 we will then introduce the status quo of investment advisory services and their main issues. Section 1.3 will proceed with the dissertation's main contribution: the novel approach to address issues of investment advisory services by supporting client-advisor encounters with shared collaborative IT artifacts. An outline of the main research questions as well as the structure of the dissertation will conclude the introduction (Section 1.4).

1.1 Context of this Research

This dissertation's research is mainly based on two successive projects with which the author was involved. The first research project incorporated a large study on investment advisory quality of Swiss financial service providers and was conducted in cooperation with Solution Providers in 2008. The author of this dissertation was significantly involved in designing and executing this project, as well as principally responsible for analyzing its results. The project's main findings were reported in Mogicato et al. [2009] and Schwabe and Nussbaumer [2009]. Results on advisory quality reported in Essay I of this dissertation are mainly based on revised and extended analyses of data gathered in course of this project; Essay I further includes data on client information behavior, which were also collected in course of this project and reported in Nussbaumer et al. [2009; 2011].

The first project provided the corner stones of the dissertation's appreciation of current issues in investment advisory encounters; the solution approach of increasing transparency, however, was developed and evaluated as part of a second research project entitled "Investment Advisory Services 2.0". This project was conducted from 2010 to 2012 as a joint project of University of Zurich, UBS and Zurich University of the Arts; it was co-financed by the Swiss commission for technology and innovation (CTI). The project's goal was to investigate the concept and effects of IT-supported and transparent investment advisory encounters, as they are also discussed in Nussbaumer and Schwabe [2010]. The author of the dissertation was involved as operative project leader and principal investigator of the concept of transparent IT support as well as its effects on client perception. The project's findings were reported in Nussbaumer et al. [2011; 2012b; 2012c] as well as Schmidt-Rauch and Nussbaumer [2011]. Partly based on these previous publications, Essay II of this dissertation summarizes the project's concepts and results.

The third Essay's concept of cost transparency emerged from empirical findings of the first research project. It was further developed and evaluated in cooperation with à Porta [2010]. While the latter work focuses on the organizational ramifications of (cost-) transparent business models and their effects, Essay III of this dissertation focuses on the principles of collaborative IT artifact design to enable cost transparency in client-advisor encounters. A shortened and adapted version of Essay III was published in Nussbaumer et al. [2012a].

1.2 Issues of Investment Advisory Services

Investors seek investment advice for numerous reasons, e.g., because of a lack of financial knowledge, interest or time [Financial Services Authority 2002:15–17] or to find "assurance of doing the right thing" [Cocca et al. 2009:33]. Such advisory encounters, however, are strained by several characteristics that are detrimental to advisory quality, including information, interest and knowledge asymmetries [Golec 1992; Oehler and Kohlert 2009; Sharma 1997].

Information and knowledge asymmetries result from the client typically being a layperson seeking advice from an expert advisor, i.e., thus being generally less knowledgeable and informed. Thus, she cannot be sure whether the advisor actually gathers and provides all relevant information to recommend appropriate solutions to her investment needs. Such asymmetries can also be conceptualized as transparency issues [Nussbaumer and Matter 2011], relating to the difficulties of the client to comprehend or see through the advisor's information base (information transparency), including the costs of the advisory service and its results (cost transparency), as well as understanding the advisor's activities from the initial problem statement to the final recommendation (process transparency).

The relationship between clients and advisors can be additionally strained by potential conflicts of interests (interest asymmetries) that may affect the trustworthiness of the advisor [Inbar and Tractinsky 2011; Nussbaumer and Schwabe 2010]. Advisors might exploit the lack of transparency by, e.g., superficial information gathering and provision or, even worse, recommending products that are unsuitable for the specific client's needs but profitable in terms of fees and provisions.

Unsurprisingly, these inherent issues are also reflected in the low reputation of such services in research [e.g., Evers et al. 2000; Hackethal et al. 2012; Mullainathan et al. 2011; Oehler and Kohlert 2009] and consumer reports [e.g., Stiftung Warentest 2007; Stiftung Warentest 2010]. In a recent study (reported in Essay I), we found that also for Swiss financial service providers – after all, ranking among the leading global institutes for private banking and wealth management [Birchler et al. 2011] – client satisfaction with such services is low.

While Swiss financial service providers increasingly try to improve advisory quality by establishing standardized advisory processes [Mogicato et al. 2009] – and in this way seek to also improve client satisfaction as well as to differentiate themselves from competitors [Buhl and Kaiser 2008] –, their

clients seem to acknowledge the low advisory quality by infrequent and late usage of such services [Nussbaumer et al. 2009; Nussbaumer et al. 2011]. This leads to an unsatisfying equilibrium, where both FSPs and clients cannot seem to reap the services' potential benefits. FSPs miss the opportunity to differentiate themselves with superior service quality (potentially improving client satisfaction and retention, share of wallet etc.); clients are inhibited of efficient and effective financial advice, for which interpersonal advisory services may be most appropriate as a starting point of information search [Ellis et al. 2002].

In general, two main solution approaches to these problems prevail. First, from an agency perspective, solutions have been predominantly sought in pre-contract (i.e., pre-encounter) strategies, e.g., screening or signaling [Bergen et al. 1992]. Screening relates to the client principal gathering information about the potential agents, i.e., FSPs or advisors, to determine their "true" characteristics. Signaling involves additional action of the agent, aiming to signal to principals that he is superior to other agents (e.g., in respect of qualifications). Besides the higher costs for either clients or advisors involved in such activities, they only provide conditions to cope with ambiguity before the encounter rather than to actually reduce existing asymmetries in the encounter [Singh and Sirdeshmukh 2000:153].

Second, legal frameworks have been developed to address existing asymmetries in financial advisory services in a top-down manner and establish uniform regulations for consumer protection. For European markets, the most prominent example is the Markets in Financial Instruments Directive [MiFID; European Commission 2004]. Basic duties of allegiance, due diligence and information disclosure have also been defined for Swiss FSPs [FINMA, Eidgenössische Finanzmarktaufsicht 2008; Roth 2009]. Such legal duties require FSPs to establish basic transparency, e.g., that the advisor collects all relevant client information and in turn provides her with all relevant information for the potential investment decision [Oehler and Kohlert 2009:98]. However, research has frequently pointed to weaknesses and failures of the legal frameworks [Jungermann and Belting 2004; Kohlert 2009], arguing that they show little effect on advisory practice because of their generic nature – being neither comprehensive nor specific enough – and their unrealistic assumptions regarding the client's prior knowledge and ability to comprehend the provided information [Oehler and Kohlert 2009:98–99].

Thus, both solution approaches fail to adequately address existing asymmetry and transparency issues in client-advisor interactions of

investment advisory services. Indeed, little research has pointed to bottom-up approaches of alleviating the prevailing issues of investment advisory services at their locus of emergence – the client-advisor encounter. While in current FSP advisory practice information technology (IT) plays a minor role – especially in supporting client-advisor encounters [Schwabe and Nussbaumer 2009], which are mainly based on pen and paper –, we attribute IT an important role in alleviating current issues of advisory encounters. For quite some time, research on group support has highlighted the possibilities of collaborative IT systems in joint task- and problem-solving [Fjermestad and Hiltz 2000; Mittleman et al. 2008; Nunamaker et al. 1996]. However, only more recently did research suggest such collaborative IT systems to have great potential to enhance advisor-client interaction, e.g., in the domains of travel counseling [Novak and Schmidt 2009; Rodden et al. 2003] or advisory services for citizens [Schenk and Schwabe 2010].

In investment advisory services, which are strained by information, knowledge and interest asymmetries, such shared collaborative IT systems could mediate client-advisor interaction and transparently provide relevant, comprehensible information regarding advisory content, process activities and costs. This could allow for enhanced transparency towards the client, while restricting the advisor to engage in hidden information or hidden action, paving the way for more satisfying advisory encounters [Nussbaumer and Schwabe 2010]. The dissertation's main contribution is to investigate the feasibility and utility of such a solution approach.

1.3 General Idea of the Dissertation's Solution Approach

As indicated above, the general solution approach of pre-contract strategies does not actually reduce transparency issues of investment advisory encounters. Top-down regulations, on the other hand, already point to a promising direction: they in fact obligate FSPs to increase transparency of their investment advisory services. Due to their lack of specificity, however, they show limited actual effects in improving information exchange between client and advisor.

Thus, in this dissertation we propose a novel *bottom-up* approach to increase the transparency of investment advisory services: introducing shared collaborative IT artifacts into client-advisor encounters. The idea is to equip investment advisory encounters with an IT artifact that mediates the client-advisor interaction and provides a common reference of discussion. The shared informational resources allow visualizing and exploring relevant information regarding the advisory activities (process transparency: what

activities are performed and why?), the information processed therein (information transparency: what information is used for what purpose?) as well as their effects, e.g., regarding recommendations and their costs. Thus, the first hypothesis of this dissertation is:

H1: Supporting investment advisory encounters with shared collaborative IT artifacts improves the client's perceived transparency compared to the traditional encounter.

As the information carrier is shared and may be used and monitored by both parties, the advisory process and its accomplished results should not only be more transparent and comprehensible for clients but also allow for improved client involvement and control. As such, the client should be enabled to take more control of the process and its results, i.e., co-creating and personalizing the solutions. We therefore hypothesize:

H2: Supporting investment advisory encounters with a shared collaborative IT artifact increases the client's perceived controllability compared to the traditional encounter.

Client dissatisfaction with current investment advisory services is often related to their lack of transparency and personalization as well as the perceived low assurance regarding the advisor's interests and goals (see Essay I). The basic characteristic of sharing all relevant information should also influence this problem of interest asymmetry – the advisor is hindered to omit important activities (e.g., ensuring compliance to existing regulations) and restricted from opportunistically hiding important information. Overall, addressing the current problems and potential causes of client dissatisfaction with shared collaborative IT artifacts should improve the client's perception of the encounter and increase her satisfaction:

H3: Supporting investment advisory encounters with a shared collaborative IT artifact increases the client's satisfaction compared with the traditional encounter.

Based on our general idea of transparent advisory support, we have developed several iterations of IT artifacts for mediating the client-advisor interaction (Essays II and III). In experimental evaluations we could show that shared collaborative IT artifacts are able to significantly improve the encounter's process, information and cost transparency, as well as increase the client's perceived controllability compared to the traditional pen and paper advisory encounters. Finally, we also found that such mediating

artifacts can significantly increase the client's overall satisfaction with the investment advisory encounter.

1.4 Research Questions and Outline

To support its underlying thesis, the dissertation builds on three main research questions, which are addressed in three research essays. In general, we answer the research questions from the perspective of Swiss investment advisory services, investigating issues in advisory practice of Swiss FSPs and validate and evaluate our solution approach with Swiss advisors and clients. We argue, however, that our observations and conclusions regarding the general asymmetry issues in investment advisory services are generalizable and applicable to other countries as well, with research pointing to similar issues for European financial markets (e.g., Germany [Hackethal et al. 2012; Oehler and Kohlert 2009], United Kingdom [Atkinson et al. 2007], Austria [Hanke et al. 2006]) as well as the United States [Krishnan et al. 1999; Mullainathan et al. 2011].

The first research question relates to an investigation of the status quo of investment advisory services, focusing on the prevailing issues in client-advisor interaction and existing solution approaches: *What are the prevailing issues of client-advisor interaction in investment advisory services?*

We will investigate this question in the context of Swiss investment advisory services in Essay I. Its results support the premise of the dissertation's thesis that investment advisory encounters are strained by transparency issues that lead to low client satisfaction. Essay I provides the dissertation's starting point of argumentation for the investigated problems and the proposed solutions. Further research questions of the essay relate to the general role of investment advisory services for Swiss investors, the investment advisory quality of Swiss financial service providers and the clients' as well as FSP stakeholders' assessment therewith, and the role of IT support in investment advisory services.

The second main research question concerns the dissertation's proposed solution approach to the prevailing issues of investment advisory services: *What are the design principles of shared collaborative IT artifacts to address transparency issues in investment advisory encounters?*

Answers to this question will support the thesis' proposition that shared collaborative IT artifacts are a feasible means to improve transparency in investment advisory encounters. The dissertation investigates this question

as part of Essay II and Essay III, where the former is concerned with the design requirements of establishing process and information transparency; the latter provides design considerations to address cost transparency with shared collaborative IT artifacts.

Finally, the third research question relates to the influence of the dissertation's solution approach on investment advisory encounters: *What are the effects of shared collaborative IT artifacts on the client-advisor interaction in investment advisory encounters?*

The answers to this question will be concerned with the efficacy and usefulness of the dissertation's solution approach in addressing transparency issues of investment advisory encounters; they seek to support the thesis' proposition that shared collaborative IT artifacts are a useful means to improve transparency and to also increase client satisfaction. The dissertation will provide support for the usefulness of its solution approach both in Essay II, regarding the usefulness of process- and information-transparent artifacts, and Essay III, concerning the usefulness of cost transparent collaborative IT artifacts.

The dissertation's essays are based on several peer-reviewed papers in which we have previously discussed some of these questions. Details on the previous and on-going publications and their relation to the research essays are provided in Section 3, which also gives an overview of the three essays along with their main findings.

The dissertation is structured as follows. Chapter 2 describes the general research paradigms and methodologies that guided the research process. In Chapter 3, we will provide an overview of the dissertation's three essays, and summarize their research questions and findings. We will provide a conclusion of the dissertation with its main contributions in Chapter 4. In Chapter 5, we discuss the limitations of this research and point to some promising directions of future research. Finally, Chapters 6-8 are dedicated to the three research essays.

2 Methodology

Information Systems (IS) research is typically characterized by two paradigms, behavioral science and design science research. While the goal of behavioral science is to "develop and verify theories that explain or predict human or organizational behaviors" [Hevner et al. 2004:75], design science seeks to develop innovative, useful solutions for practical problems "to extend the boundaries of human and organizational capabilities" [Hevner et al. 2004:75].

The dissertation's thesis – "Shared collaborative IT artifacts are a feasible and useful means to improve transparency of investment advisory encounters and, thus, to increase client satisfaction." – features a particular stance pointing to design science, as it stresses the investigation of feasibility and usefulness of a specific class of IT artifacts. As such, the dissertation is construction-oriented and follows an applied research / engineering mode of inquiry, using scientific knowledge to create technological artifacts that solve an important practical problem [Briggs and Schwabe 2011].

Hevner et al. [2004] define three pillars of a design science research: the environment (problem space & application domain), the pillar of actual design research (building design artifacts and justify/evaluate them), and the knowledge base (theories, frameworks, methods etc., drawn from both the foundations of design science and the application domain). Between these pillars, Hevner [2007] identifies three research cycles: (1) the relevance cycle, which initiates design science research with requirements from the environment and evaluates the artifact in the application domain with field tests, (2) the rigor cycle that provides knowledge to the research project from the knowledge base and returns the research results, and (3) the design cycle, which is concerned with the construction and evaluation of the artifact, whereas it builds on requirements of the relevance cycle and the theories and methods provided by the rigor cycle.

The dissertation's research is generally based on these notions of design science research. As design science research is a research paradigm rather than a research methodology [Baskerville 2008; Iivari 2007], however, it does not provide specific guidelines in respect of the research process and its methods. Such a methodology for conducting design science research in IS has been proposed by Peffers et al. [2007]. They suggest performing design science research along six subsequent activities from problem identification to reporting the validated solution. After having (1) identified a practical problem and shown its importance, iteration loops of a solution-finding

process are initiated, where each loop (2) defines the respective solution's objectives, (3) designs and builds the artifact, (4) demonstrates how the artifact may be used to solve the problem identified in step 1, (5) evaluates its efficiency and effectiveness and, if the artifact fulfilled the solution objectives, (6) communicates the results in scholarly publications. If the artifact failed to fulfill the objectives in step 5, a consecutive iteration may be initiated, starting either with revised objectives of the solution, re-engineering of the artifact design or its implementation, or with applying the previous artifact in more suitable contexts to show its usefulness.

While this methodology provides an appropriate research process for the design research paradigm, it is generic regarding the particular methods used to analyze, design and evaluate the design artifacts. Such methods are needed to substantiate and perform the research process. We therefore concretized Peffer's et al. [2007] research process with the practical design process suggested by Rosson and Carroll [2002], which bridges the gap from design science paradigm and methodology to specific methods of performing design activities from analysis to evaluation. The relationships between paradigms, methodologies and methods and their levels of concretization are summarized in Figure 2-1.

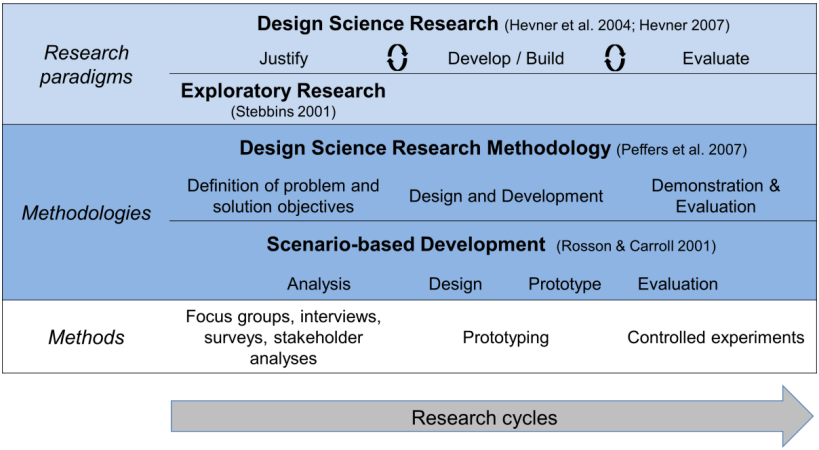


Figure 2-1: Research paradigms, methodologies and methods

Most generally speaking, our research process followed the design science paradigm [Hevner 2007; Hevner et al. 2004], whereby the justification of our design science research was mostly based on methods that are often attributed to the exploratory research paradigm [Stebbins 2001]. As these

research paradigms are abstract and do not incorporate methodologies of how to conduct the actual research process, we opted for the paradigm-compatible general research approach suggested by Peffers et al. [2007], instantiating its process with practical guidelines of scenario-based development [Rosson and Carroll 2002].
Following these methodologies along our research cycles (or iterations), we applied different qualitative and quantitative methods according to the specific research phases. While, for example, we started our investigations with an in-depth analysis of the status quo (using mostly, but not exclusively, qualitative methods), along the research process the applied methods became increasingly quantitative (e.g., controlled experiments for evaluations).

In the following, we will present how we built our actual research process and its methods upon the introduced methodologies and paradigms. We will proceed along the main activities of the design science research methodology, i.e., *definition of problem and solution objectives*, *design and development* and *evaluation*.

2.1 Definition of Problem and Solution Objectives

According to the methodology of Peffers et al. [2007], the first activity of a design science endeavor is dedicated to identifying a problem and justifying the value of a solution. For the general analysis of current issues of Swiss investment advisory services, we engaged in comprehensive exploratory research [Stebbins 2001], including qualitative and quantitative methods (focus groups, interviews, surveys). A detailed presentation of the methods as well as the results can be found in Essay I (Chapter 6).
Based on this general analysis, we initiated a total of four design cycles of building IT-based solutions that address some of the most prevailing transparency issues in advisory services. Three design cycles were dedicated to the design and implementation of shared IT artifacts addressing process and information transparency (presented in Essay II, Chapter 7), while another design cycle investigated the design of cost transparency (presented in Essay III, Chapter 8).
To iteratively design and develop the solutions in the design cycles, we employed the scenario-based approach advocated by Rosson and Carroll [2002]. It is based on close collaboration with actual users to acknowledge their problems, requirements and possible solutions. In an iterative manner, scenario-based development starts with the creation of problem scenarios in the form of short stories that mirror the researchers' understanding of the

situation and may be easily understood and validated by users. We used this approach to (1) further detail our findings from comprehensive exploratory research with feedback from clients and advisors and observations of their activities, as well as (2) summarize them in succinct descriptions of advisory practice. For the validation of the scenarios (and other outputs of the design process, see below) a total of six key users (3 advisors, 3 clients) was involved.

2.2 Design and Development

In this activity, the solution artifact is created. In design science research, the solution artifact may not only refer to a technological artifact (such as a software application), but also to "constructs, models, and methods applied in the development and use of information systems" [Hevner et al. 2004:13]. Indeed, the artifacts created in our design cycles do not only refer to the technological software artifacts but also to their embedded principles as well as methods of how to use the artifact in client-advisor encounters.

Similar to its procedure regarding problem analysis, the scenario-based approach suggests that all design and implementation phases of the development process should incorporate actual users to iteratively validate and evaluate their outcomes. The design objectives are described and validated with activity scenarios (stories about the anticipated usage of the solution artifact), upon which further activities of information design, user interface design as well as interaction design are built. These designs again are iteratively validated by actual users (advisors and clients), starting with low-fidelity paper-based prototypes and evolving to high-fidelity, functional prototypes. Such an approach allows for inexpensive and rapid improvement of the artifact's design and its implementation.

2.3 Evaluation

Design science artifacts have to be rigorously evaluated via appropriate evaluation methods [Hevner et al. 2004; March and Smith 1995; Witte 1997] such that their utility, quality, and efficacy can be demonstrated [Hevner et al. 2004:16]. The scenario-based approach distinguishes between formative and summative evaluation [Rosson and Carroll 2002:228]. Formative evaluation relates to the iterative (validation) feedback of key users and its incorporation to improve the artifact design. Summative evaluation refers to a comprehensive assessment whether the artifact fulfills its design goals and concludes the design cycle.

Several methods have been proposed for the summative evaluation of design artifacts, such as observational (case or field) studies, action research, surveys, analytical analyses, functional or structural testing, descriptive argumentation and experimental methods including controlled experiments or simulation [Cleven et al. 2009:4; Hevner et al. 2004:18; Riege et al. 2009; Siau and Rossi 2011]. In respect of its underlying thesis, this dissertation aims to show that shared collaborative IT artifacts are a useful means to improve transparency and increase client satisfaction in investment encounters – as compared to the traditional encounter. Controlled experiments are an appropriate means to test such propositions by allowing validating design artifacts against the outcomes the designer sought to improve; experiments allow measuring the degree to which the design objectives have been achieved [Briggs and Schwabe 2011]. In design science research, one experimental treatment typically relates to using the designed artifact of interest, whereas other treatments may include previously designed technological artifacts or control conditions featuring no technological artifact [Briggs and Schwabe 2011:7]. To validate the solution artifacts' usefulness and utility (and support the dissertation's thesis), we evaluated each design cycle with such experimental designs (see also the detailed presentation of the respective designs in Essay II and Essay III).

3 Overview of Research Essays

The dissertation seeks to support its main thesis along three comprehensive research essays (Chapter 6 to 8). In this chapter, we provide a summary of the individual essays with their main findings. For each essay we will also provide an overview of their associations with previous and current publications.

3.1 Essay I: Investment Advice and its Role for Investors – A Case for Advisory Support

The first essay is dedicated to address the dissertation's first research question: *What are the prevailing issues of client-advisor interaction in investment advisory services?* It reports results from exploratory research into the status quo of Swiss investment advisory services as well as their role for investors. The essay provides insights into the status quo of investment advisory practice from multiple theoretical and practical stakeholder perspectives. It includes an investigation of several dimensions of expected and experienced advisory service quality from the views of clients and FSP stakeholders (advisors, managers, IT managers) as well as in-depth research on the role of such services for investor information search.

Arguing for the importance of advisory services from both a FSP and client perspective, the essay splits its investigation of the status quo into two further research questions. In respect of the first question – What are the clients' expectations and why do FSPs fail to meet them? – it finds that client expectations are high in any surveyed dimension (e.g., personalization, assurance, IT support), but that their experiences of advisory practice are less than satisfying. Even though they correctly estimated their expectations, FSP stakeholders were not aware of the actual gaps between client expectation and experience and highly overestimated their satisfaction with investment advisory services.

Regarding the essay's second research question – What is the role of investment advisory services and what alternatives do clients employ? – results show that clients actually do not make exceeding usage of FSP investment advice. They are accustomed to use a multitude of alternative information sources to support their investment decisions, with professional Internet sources, media and personal environment being most frequently used. FSP advice, on the contrary, is perceived as rather inaccessible, inefficient, and ineffective as well as lacking trust and comprehensibility.

While most clients nevertheless use FSP advice for their information search, they mostly do so very late in the search process, using it as an exit rather than an entry point to their information search.
These premises lead to an equilibrium that is unsatisfying for both FSPs and clients. FSPs miss opportunities of differentiating themselves from competitors with superior investment advisory services; being provided with unsatisfactory services, clients are retained to reap the potential benefits of advisory services especially in the early phases of problem identification (including the reduction of uncertainty and personalized information aggregation), where information behavior research suggests personal information sources to be most effective and efficient.
Concluding, the essay finds that the most prevailing issues of investment advisory services relate to their lack of personalization and client influence, lack of advisor assurance, and, enforcing these problems, lack of transparency. Based on this observation, the essay outlines possibilities of improving the unsatisfying equilibrium between clients and FSPs by addressing the current issues of client-advisor encounters with shared IT support.

The research presented in Essay I is based on data collections which have been – for the most part – gathered in 2008 as part of a large study on investment advisory quality in cooperation with Solution Providers [Mogicato et al. 2009]. Findings regarding investment advisory IT support were published in Schwabe and Nussbaumer [2009], while findings regarding the information behavior of Swiss investors were presented in Nussbaumer et al. [2009; 2011]. Finally, the basic concept of shared IT support in investment advisory encounters was also discussed in Nussbaumer and Schwabe [2010].

3.2 Essay II: Designing for Process and Information Transparency in Client-Advisor Encounters – The Case of Investment Advice

The second essay demonstrates the feasibility and usefulness of shared collaborative IT artifacts in improving process and information transparency of investment advisory encounters, providing answers to the dissertation's second and third main research questions.

The essay relates issues of investment advisory services to problems of advisory services in general. It suggests that typical information, knowledge and interest asymmetries in client-advisor encounters may be addressed by

increasing transparency concerning (1) the disclosure of what activities are performed and why (process transparency) as well as (2) the revelation of what information is used for what purpose and with what effect (information transparency). To this end, the essay introduces a design theory for shared, transparent IT artifacts that mediate encounters of clients and advisors. The article demonstrates feasibility and utility of such an approach along three consecutive design science research cycles which aim to introduce process and information transparency in investment advisory services. From these build-and-evaluate iterations general design principles of shared transparent IT artifacts are then derived.

Experimental evaluations of the iteratively built IT artifacts demonstrate that such support may also have detrimental effects on client-advisor encounters; indeed, the first iteration artifact lead to inferior results compared to the traditional, unsupported encounters. Only after incorporating experiences and findings of a second design iteration, the third iteration artifact showed to enable significantly superior encounters compared to the traditional situation. Encounters supported with the artifact showed increased process and information transparency as perceived by clients; furthermore, supported encounters showed improved client perception of encounter controllability. Overall, the clients' satisfaction could be significantly improved in the artifact-supported encounter compared to the traditional encounter.

Based on the incorporation of experiences and findings along multiple design iterations, which ultimately led to a design artifact conforming with its design goals, the essay stresses the importance of the *concatenation* of design cycles.

Essay II builds on and includes findings from a research project that was conducted from 2010 to 2012 at University of Zurich in cooperation with UBS and Zurich University of the Arts (co-financed by the Swiss commission for technology and innovation). In parts, the project's concepts and findings reported in Essay II were previously published; the general issues of advisory encounters were partly discussed in Schmidt-Rauch and Nussbaumer [2011]. The design and evaluation of the first design cycle were reported in Nussbaumer and Matter [2011] and the differences between the first cycle and the third cycle were also discussed in Nussbaumer et al. [2012b].

3.3 Essay III: Designing for Cost Transparency in Investment Advisory Service Encounters

The final essay is concerned with answering the dissertation's second and third research question in respect of cost transparency. It investigates the feasibility of designing shared collaborative artifacts to improve cost transparency in investment advisory encounters, and demonstrates the usefulness of such artifacts in experimental evaluations.

Introductorily, the essay suggests that an important lack of transparency in investment advisory services relates to cost information. It argues that cost transparency in client-advisor encounters is relevant for at least two reasons. First, when buying or selling financial products according to the advisor's recommendation, transaction costs as well as the costs associated to a specific product (e.g., buy and sell charges, management fees) play a vital role as they directly influence the portfolio's effective return. Second, the potential conflicts of interest in investment advisory services expose the client to potential moral hazard of the advisor. The advisor may exploit informational deficiencies of the client by, e.g., recommending products that are unsuitable for the client's financial situation and needs but profitable in terms of fees.

Swiss FSPs, however, are still refraining from establishing cost transparency in their investment advisory encounters. The article ascribes this to two major reasons; first, given that IT is hardly used in Swiss investment advisory services, FSPs also lack appropriate information systems that could support the complex task of providing dynamic cost information in the client-advisor encounter. Second, FSPs often consider cost transparency as being detrimental to existing business models, i.e., providing free-of-charge advice that is cross-subsidized by selling products, which in turn involve a multitude of subsidiary costs. Possible solutions to this problem – e.g., provision of fee-based advice – are avoided by most FSPs, often based on their belief that clients lack willingness to pay for services that were complimentary before (or still are complimentarily provided by competitors).

Based on these premises, the essay is dedicated to a complete design cycle of introducing cost transparency in investment advisory encounters, using shared and transparent IT artifacts. First, the essay demonstrates the feasibility of designing and implementing such an artifact that provides cost transparency for collaborative portfolio composition between clients and advisors.

Based on findings in the literature, the essay proposes that introducing a cost-transparent artifact into the advisory encounter may relate to increased client satisfaction as well as increased client willingness to pay for the advice received. Utility and efficacy of the artifact in respect of these proposed effects are investigated in an experimental evaluation. The evaluation involves 12 client participants and 2 real FSP advisors passing two advisory settings (one being supported with the designed cost-transparent artifact, one with a similar artifact lacking cost information) and evaluating the perceived differences. Results indicate that encounters provided with the designed cost-transparent artifact were significantly more satisfying for clients as compared to encounters supported with the artifact lacking cost transparency. Furthermore, even though clients indeed tend to prefer less expensive products in the cost-transparent setting, they showed significantly increased willingness to pay for this setting.

The essay does not only demonstrate the feasibility of providing cost transparency in client-advisor encounters but also shows that such transparency relates to increased client satisfaction and willingness to pay; this may challenge the common belief of FSPs that transparent, fee-based advisory services would neither be accepted by clients nor be economically viable.

The general concept of cost transparency presented in Essay III emerged from a large study on investment advisory quality reported in Essay I. It was further developed in cooperation with à Porta [2010], in context of which the presented prototype system was implemented and evaluated. A shortened and adapted version of Essay III was published in Nussbaumer et al. [2012a].

4 Conclusion

Investment advisory services of FSPs are strained by several asymmetries between clients and advisors. Based on their layperson-expert relationship, advisors are generally more knowledgeable than their clients and equipped with specialized information provided by the FSP. While clients may seek help from advisors exactly because of such informational deficiencies, information exchange is also strained by potential conflicts of interests between the advisor and the client. Such conflicts arise where advisors are incentivized to increase revenue and his commissions by selling products that are more expensive but maybe less appropriate for the client. These asymmetries are detrimental to information exchange and, as a result, advisory quality. Clients find that investment advisory services lack comprehensibility and transparency, regarding the advisor as a "black box"; they do not consider the investment advisory encounter to be personalized and incorporating their situation and needs, perceiving little possibilities to influence or control the advisory process and its results; finally, clients find their investment advisor rather untrustworthy and are dissatisfied with his efforts of providing investment recommendations.

Counteracting these problems, the dissertation proposed the novel solution approach of shared collaborative IT artifacts. The idea was to introduce shared and transparent collaborative IT artifacts into client-advisor encounters, mediating the parties' interaction with a common reference of discussion. The shared informational resources are used to visualize and provide means of exploring relevant information regarding advisory activities (to enable process transparency), the information processed therein (information transparency) as well as their effects, e.g., regarding the advisor's recommendations and their costs.

With this approach we aimed to investigate the following thesis: shared collaborative IT artifacts are a feasible and useful means to improve transparency of investment advisory encounters and to increase client satisfaction.

In support of this thesis, we conducted several design cycles of shared IT artifacts enabling process transparency, information transparency and cost transparency. We demonstrated the feasibility of implementing shared transparent IT artifacts to support investment advisory encounters between clients and advisors. Experimental evaluation of the designed IT artifacts showed their utility and efficacy and fully supported our three hypotheses:

H1: Supporting investment advisory encounters with a shared collaborative IT artifact improves the client's perceived transparency compared to the traditional encounter.

Introducing a shared collaborative IT artifact as a transparent information reference of client-advisor interaction improved the client's perceived process transparency and information transparency compared to the non-supported (traditional) encounter. The results of the final evaluation showed that the artifact significantly improved the client's perceived comprehensibility regarding the advisory activities as well as the information used therein.

H2: Supporting investment advisory encounters with a shared collaborative IT artifact increases the client's perceived controllability compared to the traditional encounter.

Our experimental evaluations showed that providing the investment advisory encounter with a shared collaborative IT artifact with transparent information access positively affects the client's perceived influence on the encounter and its results, i.e., its controllability. In the final evaluation, the clients found the IT-supported advisory encounter significantly more controllable compared to the traditional, unsupported encounter. We also found some evidence that controllability may be positively correlated to the client's (perceived) own interaction with the shared system [Nussbaumer, P., Matter, I., and Schwabe, G. 2012c, under review].

H3: Supporting investment advisory encounters with a shared collaborative IT artifact increases the client's satisfaction compared with the traditional encounter.

The dissertation's thesis was that alleviating the current issues of asymmetric client-advisor interaction would also positively affect the most prevalent consequence of these issues – the client's low satisfaction with investment advisory services. Our evaluation showed that improving process and information transparency as well as introducing cost transparency with shared IT artifacts significantly increased the client's satisfaction compared to the traditional, unsupported encounter. An overwhelming majority of client participants (87.5%) significantly preferred the artifact-supported situation over the traditional situation.[1]

[1] Refers to the evaluation of the third design iteration of our information- and process-transparent artifact (reported in Essay II).

According to these results, the dissertation's thesis is fully supported – shared collaborative IT artifacts indeed are a feasible and useful means to improve transparency of asymmetric client-advisor encounters and to increase client satisfaction.

In supporting this thesis, the dissertation offers several contributions. We have extended existing research on investment advisory services by providing novel insights and explanatory approaches to their prevailing issues. On that account, we combined traditional perspectives of advisory quality and agency relationships with the novel aspect of the client information behavior. Our multi-perspective framework provided a deeper understanding of the current unsatisfying equilibrium between the client's needs and expectations and the respective services provided by FSPs. These insights contribute both to the domain of Information Science (applying established theories of information behavior in new practical contexts) as well as Information Systems (providing new explanatory approaches to established problems and pointing to IT-based solutions).

The dissertation's several research cycles regarding the design, implementation and evaluation of IT-supported artifacts were based on and contributed to several research domains. As a contribution to IS and CSCW research, the dissertation provides several re-usable design principles of introducing transparency in (asymmetric) client-advisor encounters. These principles encompass patterns and anti-patterns of how to support dyadic interaction with collaborative IT tools under restrictions of information and interest asymmetry. As such, we suggest that the principles are not only applicable for the domain of investment advisory services but as well for other asymmetric (advisory) situations (e.g., insurance advisory services, medical counseling etc.). Furthermore, the dissertation provides contributions in demonstrating the feasibility of incorporating and implementing such principles into shared IT artifacts, also providing one of the few showcases of *practical* organizational use of multi-touch tabletop computers. With our experimental evaluations we also provide empirical insights into effects of transparency on client behavior, which so far have been mostly theoretically addressed.

These scientific contributions are facilitated and supported by the dissertation's interdisciplinarity, combining research from diverse domains – e.g., Marketing research (service design), Economics and Finance research (agency relationships, behavioral biases of investors), Information Science (models of information behavior), Social Sciences (judge-advisor system research), and, of course, Information Systems (design science) – and

integrating their isolated perspectives into a single, comprehensive solution approach.
Another strength of the dissertation can be found in its presentation of a practical design research process. The design process integrates different research methodologies and methods into an iterative, user-centered process of building and evaluating design artifacts, and features fundamental concatenation and integration of findings from previous into subsequent design cycles.

Overall, shared collaborative IT artifacts have proven to be a feasible and useful way to address current issues in investment advisory encounters, significantly increasing both the client's perceived comprehensibility and satisfaction. Rather than following a top down approach of regulations, we believe that this approach is a promising first step of improving investment advisory services from *bottom up*, at the locus of their main issues – the advisory encounter.

5 Limitations and Future Work

While necessarily showing some limitations, our research opens up many possibilities for further research directions. In the following, we will discuss the most important limitations as well as their points of contact with promising future work.

Generalizability. While this dissertation was motivated by observations of Swiss investment advisory services, the applicability of our investigations in respect of how to address transparency issues with IT and its utility are not limited to the Swiss market. We argue that the issues of Swiss investment advice are general features of asymmetric client-advisor interaction that prevail in other countries and financial markets as well – given the investors' typically low financial literacy and their (assumed) general preference for transparency, IT support for transparent, comprehensible interaction should be generally beneficial to alleviate asymmetries in investment advisory services. This should also hold true for alternative business models that may be less affected by conflicts of interests (and are more prevalent outside Switzerland), e.g., by separating advice from product sale.
On a generic level, the design principles presented in this dissertation should also be applicable in other domains of asymmetric client-advisor interaction, especially for sales-oriented services (e.g., insurance advice, travel counseling) but also in domains where conflicts of interests are typically less apparent for the client (e.g., medical advice). Furthermore, abstracting from the domain-specific functionality, the primitives of the developed user interface and interaction designs may be a helpful starting point also for other domains that aim to support client-advisor interaction without neglecting or even disturbing the parties' social interaction.

Samples of participants. In our lab studies, we could evaluate the artifacts with experienced advisors from a Swiss partner bank, greatly improving the validity of our test consultations. Sampling actual affluent clients, however, was not possible. Thus, we recruited our evaluation participants using convenience sampling, leading to quite diverse samples regarding age, occupation as well as financial and computer literacy; however, a rather large proportion (46%) of the participants was university students. While we cannot claim that our participants were affluent clients, every individual was at least a *potential* affluent client. Thus, we provided realistic background settings for our client participants to allow them *acting* as affluent clients, e.g., by assuming that they had inherited a larger amount of money. Clients

did not report to have had problems in assuming such a role, neither did we find according indications in our observations. Furthermore, our results did not show significant effects of any demographic variable on the clients' valuation of the different advisory encounters.

Target client segments. A related question arises in respect of our assumed target segment of affluent clients. In our research, we focused on this segment for two main reasons; (1) this client segment is of increasing interest for FSPs and therefore increasingly targeted with specific investment advisory services; (2) the typical amount of an affluent client's assets and the related complexity of potential investments generally justifies the effort of rather time-consuming advisory services, as compared to smaller retail investments that are typically limited to only a few and less complex solution alternatives.

Indeed, FSPs often argue that in-depth or holistic advice (incorporating all relevant aspects of the client's personal situation) is too expensive (i.e., time-consuming) for most of their clients, with actual costs not being covered by the related provisions and fees [Kaas et al. 2002]. However, we do not intend to imply that transparent advisory encounters should be reserved for affluent clients. To the contrary, and following the argumentation of Jungermann and Belting [2004:254], we believe that improvements of advisory services should be beneficial for FSPs and clients also in lower segments, such as retail clients. While holistic comprehensive advice may be indeed be time-consuming, efficiency should increase after the initial encounter, as for the following encounters advisors and clients may build upon and, if necessary, adapt already gathered basic information (e.g., regarding the client's financial situation, preferences, needs and goals). As our research indicates, information gathering and adaptation may be effectively supported with IT. Using such an approach also for retail clients could counteract high fluctuations of client depots caused by poor advisory quality (or the client's perception thereof) and also allow FSPs to effectively differentiate against their competitors. Based on the dissertation's findings, future research could investigate the premises of according IT support and investment advisory service design.

Organizational implementation. Asymmetries issues in client-advisor encounters addressed by this dissertation are mostly related to FSPs and their advisors taking advantage of their uninformed clients; as such, our research focused on means to alleviate these problems from the clients' perspective. However, conception, design and development of the IT artifacts were

accomplished in close cooperation also with FSP stakeholders, notably investment advisors. While both the FSP managers and advisors were enthusiastic about the developed IT artifacts (with 75% of the advisors clearly preferring the IT-supported encounter over the traditional after a total utilization of only a few hours in our last evaluation), this might not necessarily be a strong indicator of actual usage in the real organizational environment. As our initial investigations on IT usage had shown [Schwabe and Nussbaumer 2009], advisors are reluctant to use IT in practice for a number of reasons, including usability and functionality issues but also being potentially related to conflicts of interest. Thus, while our approach shows great potential in lab studies, future work should also investigate the premises and requirements of rolling out such IT support in actual advisory practice, especially regarding organizational change management.

Design and technological instantiation. To demonstrate the feasibility and utility of our solution approach, we have relied on tabletop technology featuring large displays and multi-touch interaction for multiple users. However, instantiations of the concept could be developed for other technology as well, e.g., for portable hardware like tablet computers. Interesting future work relates to the applicability of our transparency design principles in technological environments that are restricted, e.g., regarding smaller display sizes or single-user interaction.

Other potential future research relates to the appropriate visualization of financial information in investment advisory encounters. For our research prototypes, we based the visualizations on depictions that are commonly used by FSPs and thus are familiar to most clients. However, there might be more appropriate visualizations, e.g., adapting to the client's knowledge and prior experience. Future research could investigate such alternative visualizations and their effects on perceived transparency and comprehensibility.

Finally, further open questions relate to the role of client interaction. Even though we designed our prototypes for direct client interaction, we found that clients were reluctant to operate the shared system by themselves and tended to prefer mediated interaction; nevertheless, the client's perceived interaction with the system positively related to her perceived control of the encounter, which might be an antecedent of client satisfaction [Nussbaumer, P., Matter, I., and Schwabe, G. 2012c, under review]. Further research is needed to clarify the role of direct client-artifact interaction and their effects on the clients' perception of the advisory encounter.

Limitations of the approach. Other approaches suggest alleviating current problems of investment advisory services either with pre-contract strategies or strict regulations. This dissertation focused to more directly address the prevailing issues of information, knowledge and interest asymmetries. There are, however, some limitations to this; while we found that with our solution approach clients indeed perceived the advisory encounter as more transparent and comprehensible, we only assessed their subjective perception. While our observations support their perception of increased information exchange quality in the IT-supported settings, we cannot conclude that the participants' objective comprehension actually increased. Future research could investigate the relations between the clients' perceived increased transparency of advisory encounters and the potential objective learning effects.

Similar to other approaches, our solution approach cannot per se neutralize interest asymmetries between client and advisors. Transparent and shared IT support may only alleviate the ramifications of conflicts of interests between the parties in that the shared information space impedes the advisor to obviously take advantage of the client, e.g., by increasing her risk profile to be able to recommend riskier (and more expensive) products. Such impediments, however, are also a function of the implemented system functionality and whether the advisor is actually obliged to use the system or specific functionality. It is easily conceivable that IT support may also further facilitate moral hazard. Thus, alignment of interest must be accomplished on the organizational level, e.g., through alterations of the prevailing business models or other means to adapt the advisors' incentive structures.

6 Essay I: Investment Advice and its Role for Investors – A Case for Advisory Support

Abstract

In private banking and wealth management, investment advisory services represent an important interface between clients and their financial service providers (FSPs). Such services can fulfill significant roles for both the clients (e.g., aggregation of relevant information, resolving complexity of investment decisions, arranging transactions) and their FSPs (e.g., differentiation through individualized service offerings, cross selling). Research and the media have frequently suggested low quality of investment advisory services, mostly related to inherent information and interest asymmetries between clients and advisors. Nevertheless, the majority of investors still seem to turn to advisors to support their investment decisions. This apparent equilibrium, however, should be neither satisfying for the FSP (lack of differentiation because of low client satisfaction and retention) nor the client (suboptimal advice). While several studies provide insights into the existing problems of advisory practice and their theoretical underpinnings, the motivational grounds of the parties' behaviors have not received much attention. Why do FSPs not attempt to differentiate themselves from competition by providing better advisory quality? What role does investment advice play for clients and what alternatives do they use?

In this essay, we address these questions with insights from a comprehensive exploratory study of advisory services of Swiss FSPs, which followed a multi-phase and multi-perspective approach to investigate behaviors and perceptions of clients and important FSP stakeholders (advisors, sales managers, information technology managers). Results show that clients are indeed dissatisfied with FSPs' advisory services. Regarding the "why", however, we find some novel explanations. On the one hand, the FSPs' efforts to improve advisory quality seem to be based on inaccurate estimations of the clients' actual experience. On the other hand, we find that most investors use advisory services in spite of their alleged low quality – they are, however, flanking their FSP's advice with information gathered from a wide variety of other information sources, such as the Internet.

We will discuss these findings along with their implications of how to improve advisory services as to allow both the FSPs and the clients to reap their potential benefits.

6.1 Introduction

The financial meltdowns of the past few years have demonstrated that relationships between financial services providers (FSPs) and their clients are fragile. Many clients withdrew their capital and abandoned their banks, holding them responsible for their monetary losses. In times of shattered markets, advisor-client relationships become increasingly strained and complex, since the client's confidence and trust in her financial advisor may be tightly connected to changes in the market and the respective gains and losses. Investigations of client satisfaction with investment advisory services [e.g., Stiftung Warentest 2007; Stiftung Warentest 2010; Weingarth 2002; Wolffensberg 2006] shows evidence that this relationship has a long history of problems that extend beyond the scope of volatile financial markets. The clients' trust is undermined by an obvious agency conflict [Eisenhardt 1989; Singh and Sirdeshmukh 2000], as well as a lack of transparency regarding the advisory process and its results [Black et al. 2002]. While the former suggests that advisors might often act in their own interests and may in fact do little to improve their clients' financial situation [e.g., Hackethal et al. 2012; Kramer 2009], the latter relates to the services' lack of comprehensibility regarding the advisor's actions and information, leading to the clients' notion of the advisor acting as a "black box" [Oehler and Kohlert 2009:93].

In recent years, Swiss FSPs have placed considerable effort into establishing and restructuring advisory processes to improve their quality and increase client satisfaction, and also plan to further focus on improving their services in the future [Lechner et al. 2009]. Such proceeding seems timely, as for FSPs differentiation against competitors may be best achieved with superior, personalized client service that is difficult to imitate [Buhl and Kaiser 2008]. Indeed, operating in one of the leading worldwide destinations for wealth management, Swiss FSPs enjoy international reputation of excellent client service and value delivery [Birchler et al. 2011; Bretschger et al. 2007]. However, prior surveys on advisory quality including Swiss FSPs and clients provide evidence that the clients' service expectations are seldom met [Andersen 2002]. Consequently, the following question arises: *What are the clients' expectations and why do FSPs fail to meet them?*

Intuitively, the status quo of investment advisory services should have some implications on the behaviors of both clients and FSP stakeholders. On the one hand, given the increasing competition through far reaching regulations and increasingly demanding clients [Crosby et al. 2011], FSPs would be

expected to comprehensively address their clients' critique as a means of differentiation. On the other hand, given the generally low quality of advice, clients would be expected to principally avoid financial investment advice provided by their FSPs. Research, however, finds that the majority of clients turn to their advisors for investment decisions [Bluethgen et al. 2008; Cocca et al. 2009; Ernst et al. 2009]. In using advisory services, they often seek to counterbalance their lack of financial knowledge (or interest), to save time and effort or to gain feedback and reassurance for their own investment ideas. This raises the question of the role of investment advisory services for clients, i.e., whether they actually obtain their information mainly from such – rather dissatisfying and untrustworthy – services or use other information sources as well: *What is the role of investment advisory services and what alternatives do clients employ?*

In this essay, we attempt to address these questions with results from comprehensive exploratory research into investment advisory services of 37 Swiss FSPs, triangulating findings from mystery shopping episodes, focus groups, interviews and online surveys. We focus on so-called "affluent" clients with minimum investments from 50'000 to 500'000 Swiss francs. This segment marks the bottom end of the private banking market and is, given its potential growth, increasingly considered a lucrative market by FSPs [Molyneux and Omarini 2005]; we also found most of the surveyed FSPs to have established structured advisory processes to target this growing segment with consistent and efficient services.

In this research, we sought insights in multiple aspects and from multiple perspectives. In addition to investigate the aspect of investment advisory service quality, we were also interested in the practical information technology (IT) support of such services. Given the exceptional importance of IT systems in FSP practice (e.g., transaction handling), we wanted to investigate their role for investment advice, as well their potential influence on advisory quality. Furthermore, addressing the question of why they use financial advice despite its ambiguous quality, we were interested in aspects of the clients' general decision-making processes – especially their information-seeking behaviors and the role advisory services play therein. We considered these aspects from several perspectives, surveying both advisory clients as well as different FSP stakeholders, such as sales managers (responsible for defining advisory processes), IT managers (responsible to adequately support the advisory processes) and advisors (responsible to perform advisory processes at the FSP-client interface).

Our results show that FSP stakeholders indeed take a quite different view on the clients' service experience and therefore fail to meet them. Consequently, we find that clients are rather dissatisfied with advisory service quality, especially regarding their personalization, assurance and transparency. We were also surprised to find that technological means to address such issues were not implemented in *any* of the investigated FSPs; even though clients explicitly voiced their expectation of supportive IT systems to visualize and simulate investment decisions, FSP stakeholders not only show different perceptions but also exhibit detrimental incentives for such IT support. Finally, we find that these issues may lead to an idiosyncratic usage of advisory services. Most clients seem to use advisory services infrequently and comparatively late in their information search processes; consequently, financial advice marks the exit rather than the entry point to information search. To support their early phases of investment decision making, however, clients gather relevant information from a wide variety of other information sources, such as newspapers, magazines or the Internet. Given that human intermediaries are superior to other information systems in uncovering and meeting information needs [Ellis et al. 2002], however, the late usage of advisory services actually restrains clients in fully exploiting their potential benefits.

In general, this essay answers its research questions from the perspective of investment advisory services in Switzerland as one of the leading wealth management markets. However, our observations and conclusions regarding the general problems of Swiss investment advisory services may be generalizable and applicable to other countries as well, with our results on advisory quality pointing to issues that other researchers have also found for European financial markets (e.g., Germany [Hackethal et al. 2012; Oehler and Kohlert 2009], United Kingdom [Atkinson et al. 2007], Austria [Hanke et al. 2006]) as well as the United States [Krishnan et al. 1999; Mullainathan et al. 2011].

The research reported in this essay is based on a large study on investment advisory encounters, which was conducted in cooperation with Solution Providers in 2008. The results are based on completely revised and extended analyses of data on investment advisory quality reported in Mogicato et al. [2009] and Schwabe and Nussbaumer [2009] as well as of data collections

on client information behavior previously reported in Nussbaumer et al. [2009; 2011].[2]

The essay will proceed as follows; in Section 6.2, we will provide some background on investment advisory services along our main phenomena of interest, including introductions into advisory service processes, their IT support as well as their role for investor information seeking. We will conclude Section 6.2 with a brief summary of the main research questions against this literature background. Section 6.3 will provide a detailed presentation of the research model as well as the methods we applied to address the research questions. Results are then presented in Section 6.4 and discussed in Section 6.5. We will conclude the essay in Section 6.6 with some implications in respect of how to improve investment advisory services.

6.2 Background

Swiss FSPs rank among the leading institutes for private banking and wealth management with the two major banks UBS and Credit Suisse housing the largest private banking departments in the world [Birchler et al. 2011:4]. Not surprisingly, banking is also important for Swiss economy, making up 18% of the nation's aggregate economic value and also supporting other economic sectors in increasing their productivity [Bretschger et al. 2007:16].

However, not only since the latest collapse of the financial markets, FSPs are facing fundamental challenges in performing their services. Increasing costs from implementing new regulations as well as cost pressure from increased competition increasingly lead to diminishing margins – according to a recent study, 88% of the surveyed private banks believe the intensity of competition to increase and only 14% were confident to be able to sustain profitability and gross revenue [Lechner et al. 2009:7].

For FSPs to persist in such competition, research finds the most promising strategy in differentiation, e.g., by offering highly personalized services which cannot easily be compared or imitated due to their dynamics and complexity [Buhl and Kaiser 2008]. Indeed, FSPs seem to be increasingly aware of the importance of such services; according to business surveys, they consequently plan to shift their future focus on client service and value delivery, acknowledging that the client "is cautious, smart, less loyal and expects excellent service and clear value" [Crosby et al. 2011:2] and expects comprehensive advice in respect to her investment objectives [Lechner et al.

[2] The specific sections are referenced throughout the essay.

2009:17]. Reports on advisory quality and client satisfaction, however, suggest that the fundamentals of such services have not yet been established and advisory services fall short of the FSPs' promises.

To investigate the gaps between the client expectations and FSP practice as well their potential solution, we seek insights from several different perspectives. While our research centers on the quality of investment advisory services, including the implemented advisory processes and their IT support, we also integrate a perspective that is seldom discussed in this context – the general role and aptitude of advisory services for client information search and decision making.

We will discuss the related background in the following, starting with an overview of investment advisory services (Section 6.2.1) and proceeding with analyzing the role of IT in such services (Section 6.2.2). We will then look at the role of investment advisory services for the investors' information search of investors (Section 6.2.3). Section 6.2.4 concludes this section with our related research questions.

6.2.1 Financial Investment Advisory Services

The term "financial advisory service" relates to the most general description of client-FSP interaction and may include a wide range of different services, ranging from retail products (such as payment and account facilities, mortgages etc.) and investment-related services (e.g., brokering and maintaining exchange-traded products like stocks and mutual funds) to individualized wealth management services (e.g., fiscal advice). In private banking – i.e., an FSP's division reserved to wealthy clients (such as, increasingly, "affluent" clients) – such services are often combined [Molyneux and Omarini 2005:2], e.g., by providing basic retail services of accounting with investment advisory services. In the literature, especially the latter have received much attention because of their exposition to the complexity and volatility of financial markets. In contrast to retail-only services, these services are typically conducted on a one-to-one basis via a financial advisor or relationship manager, creating a link between the client and the FSP [Driga et al. 2009:232]. This role constitutes the main client interface to the FSP, offering "its professional financial expertise to individuals who seek assistance or want to completely delegate their investment decisions" [Fischer and Gerhardt 2007:9]. In this essay, we will mainly refer to investment advisory services that focus on supporting the client's decision-making regarding her financial investments, regardless

whether they are performed "stand alone" or embedded in comprehensive "holistic" advice (i.e., combined with retail products and services).
In general, sales-oriented advisory services like investment advice may be delimited from other professional counseling and advice, e.g., in socio-psychology; these strive to provide decision guidance for a client and her specific problems by means of brokering information and practice of capabilities [Schwarzer and Posse 1986], with the ultimate goal of helping the client in helping herself. Financial advice may also be delimited from "everyday advice", i.e., the information exchange between co-workers, friends and family, which constitutes seventy percent of all "advisory encounters" [Warschburger 2009:4].
Today, the notion of advice is exceedingly used in contexts of service provision, such as management consultancy, travel counseling or financial advisory services [Schmidt-Rauch and Nussbaumer 2011]. Indeed, in such settings clients seek to be enabled and supported to solve a problem (e.g., make-or-buy decisions, planning holiday trips or optimizing personal financial investments) – however, the advisory and consulting services are sales-oriented and potentially strained by the providers' self-interest to provide recommendations that are geared towards revenues rather than the clients' needs. For financial (investment) advisory services, a considerable amount of research has pointed to such inherent problems of information and interest asymmetry and their implications on quality and regulations [Buhl and Kaiser 2008; Evers et al. 2000; Jungermann 1999; Oehler and Kohlert 2009].

Much literature has investigated advisory services from the perspective of their underlying processes of client-provider interaction, e.g., especially in the domains of management consultation [Elfgen and Klaie 1987; König and Volmer 1996; Lippitt and Lippitt 1984] and financial service and insurance provision [Bechmann 2002; Haller and Ackermann 1995; Howald 2007; Mutter 2003]. Such processes have also found their pendants in marketing practice, where FSPs increasingly promote their advisory approaches as a means of differentiation (e.g., UBS[3], CS[4]), mostly targeting wealthier, at least "affluent" clients. Though they differ in their number of advisory phases and activities as well as their naming, virtually all advisory processes

[3] https://www.ubs.com/ch/en/swissbank/wealth_management/relationship/advisory_approach.html (last retrieved on 2012-02-05)
[4] https://www.credit-suisse.com/ch/privatebanking/beratung/en/beratungsprozess.jsp (last retrieved on 2012-02-05)

from literature and practice share four generic phases (see also exemplary illustration in Figure 6-1). In the *contact* or initiation phase, the client approaches the advisor (or vice versa) because of an investment problem (e.g., investing savings in stocks or mutual funds). Advice will then be provided and discussed in the succeeding phase (*advice*), usually in (multiple) face-to-face encounters of client and advisor. In these encounters, the advisor will try to identify the client's situation and needs, structure her problems and define the investment goals [Elfgen and Klaie 1987]. In investment advisory services, the solution generated in the advice phase is typically composed of a generic investment strategy based on the client's risk profile as well as its specific mapping to a product portfolio. This portfolio is implemented in the next phase of the advisory process (*implementation*) and continuously monitored and adapted by the advisor and the client in the *support* phase; in this phase, further initiations of the advisory process may occur, activated for example by changes in the client's financial situation or needs.

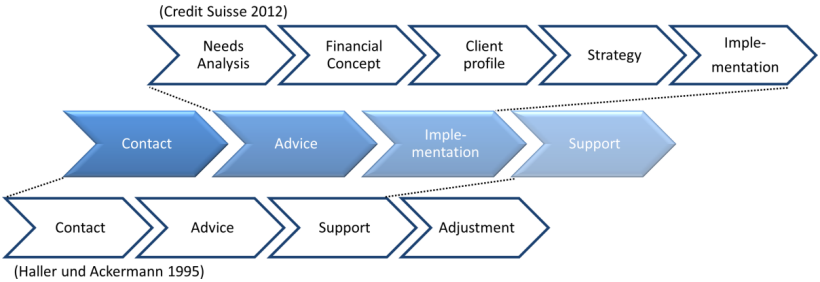


Figure 6-1: Generic advisory process, compared to processes from practice and literature

Advisory processes can be seen as the generic representation of the client-FSP interface, allowing each interaction to be subsumed into a respective advisory phase, independent from service channels (e.g., online, over the telephone, face-to-face). As such, advisory processes may also be conceptualized as the main interface between clients and their FSPs. As discussed above, this interface is increasingly important for FSPs as a means of differentiation against competitors [Buhl and Kaiser 2008]. However, they are also increasingly challenged by demanding clients as well as regulatory frameworks, both intensifying cost pressure [Birchler et al. 2011; Crosby et al. 2011].

Also from a client's perspective, improving advisory processes and their quality seems important. Clients seek financial advice for many reasons, e.g., because of their lack of knowledge regarding financial markets or their lack of interest or time [Financial Services Authority 2002:15–17]. Consequently, they find the greatest advantage of advisory services in advisors explaining relevant information, giving feedback on the client's own investment ideas and giving "assurance of doing the right thing" [Cocca et al. 2009:33]. Similarly, Bluethgen et al. [2008] argue for the need of financial advice because of complexity (individuals making mistakes in complex situations which an advisor may be able to prevent) and the related high costs of information collection. The important function of advisors to reduce complexity of investment decisions is also mirrored in the low financial literacy of typical investors. Birchler et al. [2010:29], for example, found that only 32% percent of Swiss affluent investors (investments from 0.1 Mio to 0.5 Mio CHF) evaluate their investment-relevant knowledge as being "good" or "very good", whereas the majority (61%) states to have only basic knowledge.

While clients obviously seek help of investment advisors in order to achieve superior decision quality, research on the quality of advice brokered by FSPs is quite ambiguous. Hackethal et al. [2012] find that using professional investment advice lowers portfolio returns and has negative effects on risk-return profiles; advised clients exhibit increased account turnover and investment in mutual funds, which the authors find to be "consistent with incentives built into the commission structure" [p. 510] of financial advisors. Likewise, Bergstresser et al. [2009] found few measurable advantages of customers that make use of brokers rather than buying mutual funds themselves; actually, brokered funds underperformed their counterparts purchased via direct channels (even without subtracting charges). The authors argue that their results may also reflect that brokers act in self-interest, given that fund flows were positively related to related fees. In the prevailing advisory business model of FSPs (in Switzerland and, incidentally, also in Germany and other European countries [Oehler and Kohlert 2009]), such fees – e.g., product distribution and transaction fees – are used to cross-subsidize the "free-of-charge" advisory services [Roth 2007]. Such cost considerations are problematic in terms of moral hazard as the advisor may be incentivized to optimize his or the FSPs benefits by recommending products that are more costly [Oehler and Kohlert 2009:105]. As such, lay investors relying on professional advice are potentially exposed to misselling, where – essentially enabled by information asymmetries

[Eisenhardt 1989] regarding the actual costs – advisors may sell products that do not match the client's needs but his own interests [Inderst and Ottaviani 2011].

Even if not emphasizing on such detrimental effects of financial advice, similar research finds no evidence that advised investors significantly outperform or underperform their unadvised counterparts [Gerhardt and Hackethal 2009; Kramer 2009; Marsden et al. 2011]. Thus, regarding the potential advantages of professional investment advice, Marsden et al. [2011] picture financial advisors as "clinical psychologists whose services are of value *per se*" [p. 641, emphasis in the original], in that they encourage clients to concern themselves with important investment-related tasks (like examining their needs and goals) and make them feel confident about their financial future.

Based on the above-mentioned issues, research on advisory quality [Evers et al. 2000; Oehler and Kohlert 2009] and consumer reports [e.g., Stiftung Warentest 2007; Stiftung Warentest 2008; Stiftung Warentest 2009; Stiftung Warentest 2010] alike tend to heavily criticize professional investment advice. The main critiques include the advisors' insufficient incorporation of the client's financial situation, risk profile and financial goals, lack of individualization and poor quality of information exchange, especially regarding the explanation of investment types and disclosure of their associated risks.

Legal frameworks have been developed to address such issues and to establish uniform regulations for consumer protection. For European markets, the most prominent example is the Markets in Financial Instruments Directive [MiFID; European Commission 2004]. Basic duties of allegiance, due diligence and information disclosure have also been defined for Swiss FSPs [FINMA, Eidgenössische Finanzmarktaufsicht 2008; Roth 2009]. Such legal duties require FSPs to establish basic transparency, e.g., that the advisor collects all relevant client information and in turn provides her with all relevant information for the potential investment decision [Oehler and Kohlert 2009:98]. However, research has frequently pointed to weaknesses and failures of the legal frameworks [Jungermann and Belting 2004; Kohlert 2009], arguing that they show little effect on advisory practice because of their generic nature, being neither comprehensive nor specific enough [Oehler and Kohlert 2009:98–99].

Despite these vast criticisms and despite their dissatisfaction [White and Yanamandram 2004], however, the majority of clients keeps turning to advisory services for their investment decisions – as reported by Cocca et al.

[2009], 69% of Swiss private banking clients use financial advice provided by their FSPs.

6.2.2 Investment Advisory Services and IT

Besides their basic capital and human resources, IT has long been a strategic production factor for FSPs [Marty 1996] and, thus, been a significant driver of FSP business [Lamberti and Büger 2008]. While today IT forms the backbone of an FSPs daily business, its maintenance and advancement regarding infrastructure and software applications is associated with high costs – already in 2003, IT systems in retail banking accounted for 15% to 30% of total operating costs (10-15% in private banking) [Holliger-Hagmann 2003] and in 2011 IT cost efficiency is still difficult to achieve especially for smaller FSPs [Geyran and Ackermann 2011].

In respect of investment advisory services, available IT systems are mostly related to customer relationship management (CRM) [Moormann and Schmidt 2007:20; Peppard 2000]. In practice, these systems support advisors in their advisory-related, primarily administrative tasks. To further increase the efficiency and effectivity of the advisory process, FSPs increasingly strive to support advisor activities with IT systems in terms of, e.g., mapping customer requirements to appropriate investment strategies and products. While requirements and utility of such systems have been demonstrated in scientific discourse [e.g., Dziarstek et al. 2004; Eberhardt and Zimmermann 2007; Meier et al. 2007; Winkler 2006], few such systems have been reported to have also been applied in practice [Alt et al. 2010; Borchers and Dlugosch 2006; Heutschi et al. 2006; Voss 2005]. Even more strikingly, such IT systems are often designed to be used solely by the advisor in the back office – IT support of client-advisor encounters has only recently been brought into focus through the availability of appropriate hardware, namely multi-touch enabled tabletop and tablet PCs. Software vendors increasingly promote solutions to support advisors also in the client encounter (e.g., Figlo[5], Avanade[6], Barclays[7], Finantix[8]). At the time of this writing, however, FSPs by and large are hesitant at incorporating such technology. In

[5] http://www.finovator.ru/EN/figlo-platform/150 (last retrieved on 2012-02-05)

[6] http://www.avanade.com (last retrieved on 2012-02-05)

[7] http://www.newsroom.barclays.com/content/detail.aspx?releaseid=1483&newsareaid=2 (last retrieved on 2012-02-05)

[8] http://www.finantix.com/tablet (last retrieved on 2012-02-05)

Switzerland, PostFinance[9] was the first and – as hitherto sole – FSP to officially equip their advisors with a dedicated iPad solution. So far, however, this solution is limited to advising small businesses.

Time will tell to what degree and for what purpose such technology will be used in FSP practice, and with what effects. Recent research, however, has already pointed to great potential of information technology in advisory contexts. Research on advisory systems for decision making [Beemer and Gregg 2008] highlights the possibilities of IT to support problem identification and decision making in complex and rather unstructured domains. Research on collaborative use of information technology in consultancy [Halloran 2002; Novak and Schmidt 2009; Rodden et al. 2003; Schenk and Schwabe 2010; Schmidt-Rauch and Schwabe 2011], on the other hand, demonstrate great potential of supportive IT systems to enhance advisor-client interaction. In presence of information and interest asymmetry, a collaborative advisory support system could mediate the advisor-client interaction by providing relevant information regarding advisory content, process activities and costs.

On a conceptual level, such collaborative interaction between customers and firms has been discussed as value co-creation [Vargo et al. 2008] and interactive creation of value [Reichwald and Piller 2006]. From this perspective, the company and the customer collaboratively design the product or service, implying a reduction of information asymmetry as the company has to reveal the company-specific design and production knowledge (solution space) and the customer has to reveal his problem knowledge, interests and preferences (problem space) [Novak 2009]. In such scenarios, the focus of interaction needs to shift to a reduction of the problem as well as the solution space, as complex situations of decision making with a variety of options may lead to an overwhelming effect. Thus, in such situations, collaborative IT systems pose requirements that are different from traditional group support systems [Fjermestad and Hiltz 2000; Mittleman et al. 2008; Nunamaker et al. 1996], as they have to mediate the transparent and traceable assignment of customer needs and preferences to product or service characteristics [Rodden et al. 2003]. A first conceptual framework for expert-mediated interactive value creation incorporating such requirements has been proposed by Novak [2009]. Characteristics of this concept can be found in systems for interactive, cooperative travel advisory by Schmidt-

[9] https://www.postfinance.ch/en/about/media/press/press2011/press110704.html (last retrieved on 2012-02-05)

Rauch and Schwabe [2011] as well as for advisory in public administration [Schenk and Schwabe 2010]. However, though these approaches account for the information asymmetry between advisors and clients, the applicability in presence of inherent conflicts of interests as in investment advisory services has not yet been demonstrated.

6.2.3 Investment Advisory Services and Investor Information Search[10]

Literature on individuals' information searches when making investment decisions is scarce [Loibl and Hira 2009:26], particularly that related to research investigating the specific impacts and implications of investors' information search on financial advisory services. Relevant literature can be found in general research on information seeking as well as the more specific research on consumer information search and decision making.

Theories of information seeking behavior have emerged from multiple perspectives and focused on different aspects of an individual's behavior in dealing with information (see Case [2006] and Fisher et al. [2005] for comprehensive overviews). A closely related field is the one of decision making – while information seeking is generally concerned with how individuals acquire information to satisfy some information need, decision making focuses on individuals making choices among alternatives. While organizational research is interested in the fundamental mechanics of information seeking behavior regarding advice giving and taking [Jonas and Frey 2003; Jonas et al. 2005; Sniezek and Buckley 1995], the specific use of information sources by investors has found attention in both finance research [Birchler et al. 2010; Cocca et al. 2009; Ernst et al. 2009] and consumer research [Lee and Hogarth 2000a; Lee and Hogarth 2000b; Lin and Lee 2004; Loibl and Hira 2009].

In general, investors seem to be accustomed to rather extensive search processes to fulfill their information needs, using a wide variety of information sources other than advisory services (such as media, Internet, personal environment etc.). Indeed, in a recent survey, Cocca et al. [2009] found Swiss private banking clients to make more use of the press (74.7% of respondents) than of investment advisors (69.1%), followed by the Internet (54.9%), annual reports (44.3%), friends and acquaintances (38.3%) and television (29.9%). While these figures show that advisory services are not the most important investor information source (even though they are used by the majority of investors, for reasons discussed above), they do not

[10] This section is partly based on the literature review from Nussbaumer et al. [2011:3–4].

specifically explain the role of different information sources in respect of the client's information search. For these aspects, Information Science research provides two helpful perspectives of investigation, namely the specific *characteristics* of information sources as well as their use in an individual's *information search process*. We will briefly discuss both perspectives in the remainder of this section.

Information source characteristics. Different information sources exhibit peculiar characteristics that affect their applicability for specific information gathering. In his seminal model of information behavior, Wilson [1997] suggests that different intervening variables such as personal characteristics and source characteristics may constitute barriers to information seeking and processing. Personal characteristics, e.g., refer to the information seeker's socioeconomic background and her knowledge base. Source characteristics are accessibility, credibility and channel of communication (e.g., whether the information source is a person or not).

In order to be used for information seeking, a source has to be accessible – if an individual is simply not aware of a specific information source or the costs are higher than she is prepared to pay, the use of an information source is easily inhibited. Regarding the accessibility of particular information sources, the principle of least effort [Case 2005] plays an important role. It describes the tendency of individuals to try to invest as little effort into information seeking as they possibly can, "even to the point that they will accept information they know to be of lower quality (less reliable), if it is more readily available or easier to use." [Bates 2002:6]. In general, this behavior should lead to an increased use of more accessible as well as more efficient and effective sources [Krikelas 1983; Wilson 1997].

Credibility, or more generally trust, refers to the perceived reliability and accuracy of a source's information [Wilson 1997:562]. Thereby, not trusting or believing the information provider potentially constitutes a strong barrier of usage.

Finally, Wilson [1997:562] suggests that the channel of communication may also influence the perception and use of information. Interpersonal information can be more effective for reducing uncertainty, making other individuals one of the most common sources of information; this is consistent with Krikelas' [1983] observation that individuals will prefer personal over impersonal sources. The channel of communication also influences the individual's search methods and modes. Choo [2005] distinguishes formal and informal searches, where the former includes only a few sources and is aimed simply at learning, while the latter typically

involves more sources and effort and is usually performed to find information for an impending decision or action.

Information search process. The search process, i.e., the acts of searching for information, is an important aspect of an individual's information behavior. The information need, i.e., the recognition that one's knowledge is inadequate to satisfy a specific goal [Case 2006:5], can be seen as the basic premise for individuals to initiate the search process. Belkin [2005] conceptualizes this need as an anomalous state of knowledge (ASK), i.e., an individual's state of knowledge that is in some way inadequate regarding a topic with respect to some goal. This notion is compatible with Kuhlthau's [2004] concept of uncertainty; the individual progresses in her search process to reduce uncertainty and finally fulfill her need or find a solution to her problem.

Wilson [1999] proposes a problem-solving model of four stages for an individual's search process: *problem identification* (identifying the type of problem), *problem definition* (defining the exact nature of the problem), *problem resolution* (searching for an answer to the problem) and *solution statement* (stating the answer to the problem). Wilson further suggests that each stage sees the successive resolution of uncertainty or results in a feedback loop to the previous stage if uncertainty fails to be resolved. Proposing a similar process model, Kuhlthau [2005] finds that information does not necessarily reduce, but may rather increase uncertainty – especially when information is inconsistent or conflicting.

Research on successive search suggests a refinement of the individual's problem and solution space while performing information seeking activities [Spink et al. 2002]. Individuals tend to engage in multiple, repeated searches on the same problem and thus experience shifts in the particular information seeking or problem solving stages [Spink 1996]. Thus, through successive searches the seeker may develop a better understanding of the problem and make further progress in the search process. Belkin's ASK can be conceptualized as the starting point of such a search process, implying a rather incomplete understanding of the problem at the beginning that inhibits directed, targeted searches. So, if the individual does not completely understand her search problem, she cannot specify questions. In these situations, Ellis et al. [2002] show that human intermediaries are superior to other information systems. They can use their empathy and understanding of another person's situation to help uncover hidden information needs by supplying background information or asking appropriate questions.

6.2.4 Research Questions

Against the presented background of the previous sections, we may refine our initially posed general research questions.

1. *What are the clients' expectations and why do FSPs fail to meet them?*

As discussed in Section 6.2.1, the quality and utility of investment advisory services have dubious reputation in both research and the media [e.g., Bernau 2011; Evers et al. 2000; Kohlert and Oehler 2009; Spiegel Online 2010; Stiftung Warentest 2010]. While these aspects have been frequently investigated for German FSPs [e.g., Evers et al. 2000; Habschick and Evers 2008; Oehler and Kohlert 2009], advisory quality of Swiss FSPs has not received much attention. Thus, we aim to investigate the status quo of Swiss investment advisory practice quality and the expectations and perceptions of the services' main stakeholders, i.e., the clients, advisors, sales managers and IT managers:

RQ1.1 What do advisory stakeholders perceive and expect from investment advisory services?

In Section 6.2.2 above, we have found IT systems to be a backbone of FSP business execution and also a significant cost factor [Geyran and Ackermann 2011; Holliger-Hagmann 2003]. In investment advisory service, and especially in client-advisor encounters, however, few IT seems to be used, even though research has proposed significant benefits for similar advisory domains [Beemer and Gregg 2008; Eberhardt and Zimmermann 2007; Novak 2009]. Thus, we are also interested in the status quo of IT in Swiss investment advisory services:

RQ1.2 What is the role of IT in advisory services?

2. *What is the role of investment advisory services and what alternatives do clients employ?*

Despite their dissatisfaction with investment advisory services, the majority of clients indicate to frequently use investment advice provided by their FSP [Cocca et al. 2009; Ernst et al. 2009]. In this essay, we aim to investigate this situation from the rather novel perspective of the clients' information search behavior (see Section 6.2.3). We are interested in the clients' appraisal of investment advisory services in their information search processes [Kuhlthau 2005; Wilson 1999] as compared to other information sources. We commence by exploring what information sources clients are using:

RQ2.1 What information sources do clients use and what is the role of investment advisory services?

We are then interested in the specific usage of these sources in their information search process:

RQ2.2 What are the clients' information search processes and what is the role of investment advisory services?

As discussed above, the goal of this essay is to provide an in-depth investigation of investment advisory services. We implemented our research in Switzerland as one of the leading markets for wealth management and, thus, we provide answers to the posed research questions primarily from a Swiss perspective. However, our observations and conclusions regarding the general problems of investment advisory services, especially regarding advisory quality, may be generalizable and applicable to other countries as well, with research pointing to similar issues for European financial markets (e.g., Germany [Hackethal et al. 2012; Oehler and Kohlert 2009], United Kingdom [Atkinson et al. 2007], Austria [Hanke et al. 2006]) as well as the United States [Krishnan et al. 1999; Mullainathan et al. 2011].

6.3 Methods

Since our research perspective on financial investment advisory services is rather novel, we chose an exploratory research approach. Explorative research has the goal to discover and describe unexplained phenomena, their correlates and contexts [Briggs and Schwabe 2011; Stebbins 2001]. A precept of such explorative endeavors is their broad and altering scope: "To understand well any phenomenon, it is necessary to start by looking at it in broad, nonspecialized terms." [Stebbins 2001:viii]. An important facet of explorative research is its *concatenation* of findings, i.e., linking together results of field studies in a chain, leading to cumulative grounded theory [Stebbins 2006]. Later studies in the chain are significantly guided by earlier ones, based on their findings, methods, and samples. Briggs and Schwabe [2011] argue that the products of exploratory research provide the foundation for all other modes of inquiry in Information Systems research, providing unexplained observations to theoretical research and experimental research or contribute its discoveries to applied research/engineering, e.g., through implicit design guidelines.

To gain broad and deep insights into our research questions, we applied several complementing quantitative and qualitative empirical methods. Such combination of approaches also allows for triangulation of methods in order

to mutually compensate their weaknesses [Flick 2000]. Combination of qualitative and quantitative methods allowed both developing and finding support for existing working hypotheses and seeking for a deeper understanding in areas less well understood.
Essentially, our exploration followed three general phases that were concatenated in that each phase's results informed the successive phase. Below we will detail the phases along with their goals, methods and samples.

6.3.1 Phase 1: Orientation in the Field

To gain ground in the field of investment advisory services, we started with comprehensive literature research on advisory processes in general as well as investment services in Swiss FSPs in particular. Since for the latter investigations were scant, we decided to also acquire first hand experiences of the status quo of advisory services by conducting mystery shopping episodes. Mystery shopping is a form of participant observation, where researchers "deceive customer-service personnel into believing that they are serving real customers or potential customers" [Wilson 2001:721]. It is used in a broad range of organizations to measure service performance relative to some established standard [Wilson 2001:732]. For our research endeavor, this method allowed us to gain valuable insights into the main questions of exploration, "*who* is doing (thinking, feeling) *what* to (with, for, about) *whom*, and *when* and *where*" [Stebbins 2006:490, emphasis in the original], as well as *how* and *why* it is being done. It also allowed us to investigate provider-specific differences of service provision.
The overall 21 mystery shopping episodes were conducted by four researchers from Dec 2007 to Feb 2008 in Switzerland (16) and – for comparison – Austria (3) and Germany (2). The consultations were conducted in 12 retail banks, 5 private banks and one provider of bancassurance [11]. The researchers were seeking advice for investing a minimum of 50'000 to 500'000 Swiss francs, thus representing affluent clients; each session had a typical duration of 60 to 90min.
As a basic means of structuring our observations, reports of mystery shopping episodes were compiled along categories generally based on the Needs Driven Approach [Schwabe and Krcmar 1996]. The researchers were asked to report the implemented work processes in the advisory encounter (activities and phases, timeline), their interactions with the FSP and the advisor (before and during the encounter), the provided work equipment and

[11] Service provider brokering third party investment and insurance products

workspace (materials, IT tools) as well as the provided information and how it was exchanged (e.g., information sources).

6.3.2 Phase 2: Building and First Validation of General Research Model

Based on the initial phase of field exploration with literature research and mystery shopping, we assembled the prominent phenomena of interest into a general research model. As our observations mirrored the prevailing general critique of their quality found in the literature, we were interested to find out whether they would be assessed equally by investment advisory stakeholders. Would FSP advisors and managers be aware of existing issues and their clients' perceptions and expectations?

A model incorporating such conceptions can be found in Zeithaml et al.'s [1990] *gaps model* of service quality (SERVQUAL), which provides the structural base of our research model depicted in Figure 6-2. The gaps relate to discrepancies in the clients' expectations and perceptions of service quality (Gap 1), sales managers incorrectly estimating the clients' expectations (Gap 2) as well as further gaps between the sales managements' specification of quality standards, their communication to the customer and their actual implementation. According to our main phenomena of interest, we decided to focus on the first two gaps and extend the model with further stakeholders to assess their estimation of client expectation; thus, in addition to sales managers, we decided to interview advisors (actually providing the service to the client) and IT managers (being responsible for providing supportive IT tools in service provision).

The gaps model features a multi-item scale for measuring consumer perception of service quality [Parasuraman et al. 1988]. Perceived quality is conceptualized as the individual's judgment about a service's overall excellence and results from comparing expectations with perceptions of performance [Parasuraman et al. 1988:15]. The SERVQUAL scale measures quality expectations and perceptions along five dimensions [Parasuraman et al. 1988:23; Zeithaml et al. 1990:26]:

- Reliability: correct and dependable performance of the service
- Assurance: knowledge, courtesy and trustworthiness of employees
- Responsiveness: willingness of immediate and attentive service provision
- Empathy: individual attention in respect of the customer's specific needs
- Tangibles: the service firm's exteriors, e.g., physical facilities, appearance of personnel

As depicted in Figure 6-2, we conceptualize the advisory process as the main interface between client and FSP and use it as a common frame of reference to investigate the gaps of expectations and perceptions. In addition to the general service quality, we were also interested in further aspects, such as the actual implementation of advisory processes and their IT support.

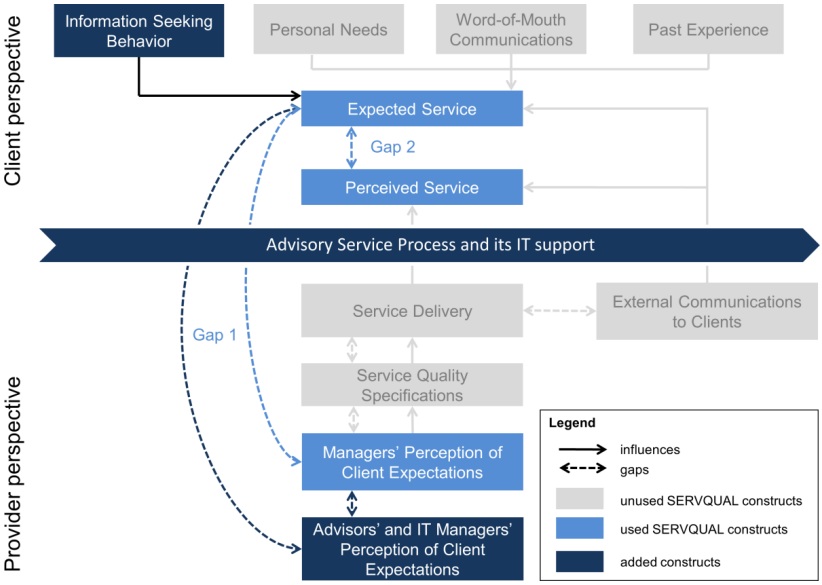


Figure 6-2: General research model, partly based on Zeithaml et al. [1990:46]

Zeithaml et al. [1990] find word-of-mouth communications, personal needs, past experience, and external communications of the service provider to be key determinants of the client's service expectation. For our purpose, we decided to put an emphasis on the role of the client's information (seeking) behavior in order to investigate the role of advisory services in her decision making process and gain insights on her rationales of using investment advice.

While the SERVQUAL model offers one of the most complete conceptualizations of service quality [Nyeck et al. 2002], it has been often criticized in respect of its underlying dimensions and their stability [Buttle 1996; Nyeck et al. 2002]. As presented above, we thus based our research on an adapted SERVQUAL model (Figure 6-2). Our main investigations of advisory quality were based on self-defined dimensions we found to be most relevant in the first research phases (e.g., personalization and assurance).

Furthermore, we constructed own metrics for these dimensions, which showed high reliability (see also Section 6.3.4). We only used the original SERVQUAL dimensions and metrics to measure the respondents' perceived relative importance of different service aspects (see above).

In a next step, we conducted focus group discussions in order to deepen our understanding of our framework's main topics as well as validating the usefulness of their conceptualizations. Focus group discussions are frequently used for marketing research on consumer attitudes and motivations [Flick 2007:259–263; Lunt and Livingstone 1996]. Focus groups explicitly use the dynamics of group interactions to generate insights on the topics of interest. As such, it may be used for discovery and as a source of ideas for quantitative testing [Lunt and Livingstone 1996:80], where salient dimensions emerging from group discussions may be used as a precursor for quantitative research.

Typically, but depending on the context and research goals, multiple focus groups are applied on the same topic to achieve "saturation" regarding potential contributions – as a rule of thumb, Lunt and Livingstone [1996:83] state that "one should continue to run new groups until the last group has nothing new to add, but merely repeats previous contributions". While the number of participants per focus group is a compromise between manageability and idea diversity of the groups [Morgan 1997], group sizes mostly vary from 6 to 10 participants [Lunt and Livingstone 1996:82].

For our research, we conducted two major focus groups to discuss our phenomena of interests from a client's perspective. The first focus group was conducted in May 2008 with 17 employees of a medium size Swiss consultancy company, the second in Sep 2008 with 11 alumni of information systems studies at University of Zurich. Managing these rather large groups was enabled by supporting discussions with an electronic meeting system[12]. The system was used to conduct electronic brainstorming episodes, quantitative questionnaires as well as written discussions and supported moderation as well as documentation of participant contributions. The focus groups lasted 150 minutes each. The majority of participants (22 of 28) categorized themselves as at least "affluent", and only 3 clients indicated their wealth being below 50'000 CHF; details on the demographics of the participants can be found in Table 6-10 in Appendix A1.

[12] Group Systems: http://www.groupsystems.com

6.3.3 Phase 3: Validate Understanding through Investigations on a Larger Scale

We initiated the third phase of exploration with two main goals; (1) to validate the cumulative findings from the client's perspective of the preceding phases on a larger scale and (2) to contextualize them with the perspectives of FSP stakeholders.

To address the first goal, we conducted a purely quantitative client survey; we addressed the second goal with interviews of the main FSP stakeholders (advisors, managers, IT managers) to get in-depth insights on their perspective regarding advisory quality. Below, we will provide details on these investigations. Both interviews and online surveys were based on items and measurements that were compiled and already used in Phase 2. These will be separately discussed in section "Items and Measurements" below.

Online survey. Surveys are well-defined sets of questions to which an individual is asked to respond, typically with no researcher present [Lazar et al. 2010:100]. Surveys seek to collect data from a larger number of people – due to their mostly quantitative items and their self-administration, they are especially appropriate to get an overview of a specific population; however, they are not particularly suited to get in-depth, detailed data [Lazar et al. 2010:101]. With the diffusion of the Internet, surveys are increasingly conducted online, i.e., using the World Wide Web [Atteslander 2006:155]. In information systems research, such surveys have been quite popular [Newstad et al. 1998; Pinsonneault and Kraemer 1993].

Our client online surveys were conducted in two waves from Sep to Oct 2008. The first wave was sampled based on self-selection and conducted in collaboration with a popular Swiss investment journal, which promoted a link to the online questionnaire on their web page. Due to length restrictions, the survey was split in two parts; one was covering questions on advisory quality (including process and IT support), the other contained questions on the clients' information behavior. The two survey parts were promoted one after the other (one week apart). The respondents of the second wave were sampled with targeted e-mailing, i.e., invitations to participate were sent to affluent clients from the researchers' environment, including the request to forward them to other interested parties. The respondents were presented the same two questionnaires from the first wave; however, the parts were combined into a single questionnaire, offering the possibility to end the survey after the first part (information behavior) or to additionally complete the second part (advisory quality).

Table 6-1 provides an overview of the profile of respondents of the different waves (investment journal, targeted e-mailing) per questionnaire (advisory quality, information behavior). The respondents show some diversity regarding age and reported wealth. With the majority belonging to the targeted affluent customer segment and above, this allowed the investigation of a broad client base.

Table 6-1: Profiles of sample for survey parts

		Advisory quality		*Information behavior*	
		Investment journal	*Targeted e-mailing*	*Investment journal*	*Targeted e-mailing*
number of respondents		*72*	*64*	*66*	*76*
age		20-88 years *M* = 52.74 *SD* = 14.29	24-69 years *M* = 40.11 *SD* = 9.88	17-75 years *M* = 50.17 *SD* = 14.33	24-69 years *M* = 39.33 *SD* = 9.71
gender	*female*	11.11%	14.06%	9.09%	15.79%
	male	88.89%	85.94%	90.91%	84.21%
wealth	*< 50.000 CHF*	2.78%	7.81%	7.58%	6.58%
	50.000 - 500.000 CHF	47.22%	7.81%	50.00%	75.00%
	> 500.000 CHF	40.28%	73.44%	24.24%	10.53%
	not specified	9.72%	10.94%	18.18%	7.90%

We tested for a potential sample bias regarding the different sampling methods by individually evaluating each sample for both questionnaires. Evaluations of the different samples regarding the advisory quality questionnaire revealed similar answer patterns and showed equal effects in respect of their differences to the FSP stakeholders' assessments; thereby, both samples lead to the same conclusions of existing perceptive gaps between clients and FSPs. Thus, we decided to merge the samples into a single data set and evaluate the pooled sample (see Table 6-2). Analogously, answer patterns of the samples were similar also for the information behavior questionnaire, revealing equal effects and conclusions for both samples. Therefore, we also merged these samples into a single data set (Table 6-2). Table 6-11 and Table 6-12 in Appendix A1 provide the detailed respondent demographics of the merged data sets.

Table 6-2: Merged online survey responses

Promotion / Survey part	*Investment journal*		*Targeted e-mailing*		*Total completed*
	Respondents	*Completed*	*Respondents*	*Completed*	
Advisory quality	180	72 (40.0%)	76	64 (84.2%)	136
Information behavior	107	66 (61.7%)	126	76 (60.3%)	142

Interviews. In contrast to surveys, which are appropriate for broad investigations of the topic of interest, interviews are a common method of in-depth, qualitative investigations [Lazar et al. 2010:178]. In this respect, interviews are similar to focus group discussions, whereas they are typically conducted in one-to-one encounters of interviewer and interviewee. Interviews may be conducted to investigate subjective perspectives of different social groups, and their results be used either as an input for further quantitative investigations or to deepen insights from previous findings [Flick 2007:201].

In order to investigate the provider perspective on our topics of interest, we conducted a total of 62 guided interviews with stakeholders of 37 major Swiss FSPs from Jun 2008 to Oct 2008. To gain insights in advisory services from a FSP perspective, we interviewed advisors, sales managers as well as IT managers concerned with advisory processes and their IT support. Table 6-3 gives an overview of the number of interviews conducted per perspective.

Table 6-3: Overview of FSP stakeholder interviews

FSP Stakeholder	*Role*	*Average Duration*	*# Interviews*
Advisor	Direct contact with the client, providing her with investment advice.	60-90min	22
Manager	Sales manager responsible for advisory processes and their implementation (typically senior executives).	60min	28
IT managers	Managers responsible for providing advisory-relevant IT support.	60min	12

The interviews were semi-structured [Atteslander 2006:125], i.e., while the interviewers followed a standardized written guideline providing questions and their order, they were encouraged to ask additional questions for clarification or to follow interviewee comments. For all stakeholders,

specific interview guidelines were developed, containing open-ended questions regarding the SERVQUAL dimensions, advisory processes as well as their IT support; the guidelines shared a specific set of identical questions that were asked all stakeholders in order to allow for comparison. Furthermore, each guideline contained a set of quantitative items that was also used for the client survey. Thereby, we asked the interviewees to provide their estimation of client expectations in respect of the different advisory dimensions; this allowed statistical comparison of the stakeholders' opinions with those gathered from the client survey. Interviews were audio-taped and evaluated based on the recordings; for interviews that could not be recorded (7 advisor interviews; 5 management interviews; 1 IT manager interviews), interviewer notes of the answers were used as the basis of evaluation. In two of five non-recorded management interviews, the interview partner could not be interviewed face-to-face and electronically answered the questionnaire.

6.3.4 Items and Measurements

As discussed above, our exploratory research endeavor was conducted in three consecutive phases. While the first phase was highly qualitative in nature, it furthered our understanding of the domain and its most important phenomena. In the second phase, we conceptualized the phenomena of interest, compiling and constructing basic items for their measurement. As we will detail in this section, we drew these items from three sources, i.e., (1) the literature, (2) discussions with advisory professionals of our partner organization that we conducted our study with, (3) experiences and insights from our early research phases.

We used these items for the focus groups in the second phase to investigate client opinions on advisory quality, advisory processes and IT support as well as their information behavior. In the focus groups, quantitative scales were mainly used as a starting point and initiator of broad qualitative discussions. Thereby, we could gain first experience with the items' comprehensibility and validity.

For the third phase, which had the goal of gaining a more extensive sample of respondents in interviews and online surveys, we extended and adapted the quantitative scales.

In any method of data collection (focus groups, interviews, survey) additional control variables were included, such as items to measure age, gender, education, assets, and subjective knowledge of asset classes. These were operationalized as continuous (e.g., age), categorical (e.g., education,

assets) or binary variables (e.g., gender). The variables along with their analyses are presented in Appendix A1.

Advisory quality. To investigate our first research question (RQ1.1), we were interested in the client's perception and expectation of investment advisory services. The quantitative scales measuring the clients' experienced and expected service quality as well as the FSP stakeholders' assessment thereof were generally based on the SERVQUAL questionnaire [Zeithaml et al. 1990]. This questionnaire provides a multiple-item scale to measure different service quality dimensions (reliability, assurance, responsiveness, empathy, tangibles) as well as the client's overall satisfaction. While we asked respondents to assess the relative importance of the five dimensions (see below), from our focus group discussions and interviews the topics of satisfaction, assurance and personalization emerged to be most relevant and interesting for our research goals. Thus, we based our online surveys on scales to measure these dimensions. The final scales regarding advisory quality are presented in Table 6-4. Items were presented as seven-point Likert items, where 1 was "I strongly disagree", and 7 was "I strongly agree". In the online survey, client respondents were offered an additional answer category of "I don't know". Items attributed to this category were excluded from analysis for the respective respondent. To test their reliability, we computed Cronbach's alpha for all Likert scales – with all scores greater than the suggested cut-off value of 0.7 [Nunnally and Bernstein 1994], the scales showed satisfying reliability.

As indicated in Table 6-4, Likert scales of personalization and assurance were measured twice to assess the respondent's agreement regarding her expectation as well as experience (perception). For example, to assess their perceived and expected assurance, the client respondents would respond to the items "I expect the behavior of very good advisors to be instilling confidence in clients" and "The behavior of advisors is instilling confidence in clients", respectively. Note that, as suggested by Zeithaml et al. [1990], expectation was measured in respect to excellent service and "very good" advisors.

In the interviews, FSP stakeholders responded to the same scales, however, with two notable differences. First, for all scales other than satisfaction and advisory process quality (where all respondents assessed *experience*), advisors and managers were only provided with items on *expectations*. Second, they were asked to respond to both experience and expectation items according to *how they thought their clients would assess them*. IT managers were only asked to assess the client's expectation on IT (see below).

Table 6-4: Advisory quality scales with items and reliabilities

Likert Scale	*Items*	*Cronbach's alpha (expectation)*	*Cronbach's alpha (experience)*
Satisfaction	• "I was very satisfied with the investment advisory service." • "I would highly recommend the investment advisory service."	-	.958
Personal-ization	• "I expect very good advisors to adapt their advice to the specific situation and requirements of the client." • "I expect very good advisors to pay attention that relevant client information is up-to-date." • "I expect very good advisors to consult experts if uncertainties appear." • "I expect very good advisors to always respond to the client's requests." • "I expect very good advisors to incorporate the client's situation and requests into their advice."	.733	.877
Assurance	• "I expect the behavior of very good advisors to be instilling confidence in clients." • "I expect very good advisors to have sufficient knowledge of developments regarding financial market." • "I expect very good advisors to have sufficient knowledge of the products they are supplying." • "I expect very good advisors to recommend adequate solutions for the client's problems."	.811	.916

We also measured the client, advisor and manager respondents' assessment of the relative importance according to the original SERVQUAL dimensions, based on the items presented in [Zeithaml et al. 1990:184]. They were asked to allocate a total of 100 points among the following features.

- Reliability: "The bank's ability to perform the promised service dependably and accurately."
- Assurance: "The knowledge and courtesy of the bank's employees and their ability to convey trust and confidence."
- Responsiveness: "The bank's willingness to help customers and provide prompt service."
- Empathy: "The caring, individualized attention the bank provides its customers."

- Tangibles: "The appearance of the bank's physical facilities, equipment, personnel, and communication materials."

Advisory process quality. We were not only interested in the respondents' assessment of general dimensions of service quality but also in their particular perception of the service procedure, i.e., the advisory process. Thus, analogous to advisory quality scales, we provided clients and FSP stakeholders a scale to assess their perception of the process quality. In discussions with advisory experts of our partner organization, we defined five relevant aspects of advisory process quality, related to its *costs*, *duration*, perceived *efficiency* and *effectiveness*. The respective items were used in focus groups, online surveys and interviews. Again, FSP stakeholders were asked to assess how their clients' would respond to the items.

Table 6-5: Scale for measuring experience of advisory process quality, with items and reliability

Likert Scale	*Items (experience)*	*Cronbach's alpha (experience)*
Advisory process quality	• *Costs*: "Monetarily, the advisory process is too expensive (i.e., it is not worth the advisor's fees and commissions)." • *Duration*: "Proceeding from information need to the investment decision takes very long." • *Efficiency*. "Coming to a decision is too time-consuming." • *Effectiveness*: "The advisory process reliably leads to a very good decision."	.801

Table 6-5 gives an overview of the Likert scale, along with its items and computed reliability[13]. Item measurements ranged from 1 ("I strongly disagree") to 7 ("I strongly agree"), whereas survey respondents were offered an additional answer category of "I don't know". Items attributed to this category were excluded from analysis for the respective respondent.

IT support. To quantitatively measure the client's perception and all respondents' expectation regarding specific advisory IT support (related to RQ1.2), we used the seven point Likert items presented in Table 6-6. In defining the different categories of advisory process IT support, we could again draw on the experience of our partner organizations' domain experts. In accord with their practical insights regarding IT tools that were used in investment advisory practice, we defined four classes of IT systems related

[13] Negatively coded items (1-3) were recoded for calculating reliability.

to communication support, information access, decision support and self-advice. We used this classification for focus groups, interviews and online surveys. Due to their specific semantics of investigating different information systems, we could not summarize the items to a single scale and compute its reliability. Thus, results of items on IT support were evaluated individually.

Analogous to the advisory quality scale, each item regarding IT support was phrased to assess the client's perception (e.g., "Banks provide software programs that allow for self-advice.") as well as her expectation (e.g., "I expect very good banks to provide software programs that allow for self-advice."). FSP stakeholders (advisors, managers, IT managers) were only asked to assess their clients' expectations.

Table 6-6: Items to investigate expectation regarding different information systems

	Items (expectation)
IT support	• *Communication support*: "I expect banks to provide a wide range of possibilities to communicate with advisors (e.g., e-mail, instant messaging, video conferencing, SMS)." • *Information access*: "I expect in advisory encounters IT systems to be available that allow incorporating up-to-date information (e.g., rates, ratings, tests…) into decision making." • *Decision support*: "I expect in advisory encounters IT systems to be available that allow simulation and visualization of investment scenarios by incorporating life stages and important events." • *Self-advice*: "I expect banks to provide according software programs (e.g., checks of financial situation) to allow for self-advice."

Information seeking behavior. In contrast to other phenomena of interest, items on information seeking behavior were only responded by clients in focus groups and online surveys. Related to RQ2.1, the participants were prompted to evaluate properties of several information sources, which were classified into seven categories. Similar categories were used in the surveys of Ernst et al. [2009] amongst German shareholders and Cocca et al. [2009; 2008; 2006] amongst Swiss private banking clients, whereas we further divided the categories of investment advice (provided by banks, provided by independent FSPs) and Internet (professional and informal sources) to evaluate their potential differences:

- personal environment (family, friends, co-workers, etc.)
- advisory services provided by banks
- advisory services provided by independent FSPs

- professional Internet sources (stock exchange web sites, finance news, sites of FSPs)
- informal Internet sources (online communities, blogs, etc.)
- media (newspapers, magazines, TV broadcast, print and online-access)
- guidebooks (books, stock market letter).

We asked the respondents to rate these information sources for investment decisions to several criteria. Based on RQ2.1, we were interested in FSP clients' usage of different information sources, which we conceptualized as their *frequency of usage*. Further criteria were derived from the literature (see also Section 6.2.3): based on the source characteristics of Wilson [1997], we were interested in the clients' perception of *accessibility* and their *trust* in the information sources. Regarding the personal characteristics that may interfere with a client's information search, we were also interested in the clients' perceived *comprehensibility* of different information sources. Based on the principle of least effort [Case 2005], which suggests that clients might make greater use of more *effective* and *efficient* sources, we were also interested in the influence of such criteria on information source usage. The individual criteria were measured using the following items:

- frequency of usage: "How often do you use the following information sources for investment decisions?"
- accessibility: "This information source is easily accessible for me."
- trust: "I trust in this information source."
- comprehensibility: "The information provided by this source is comprehensible for me."
- inefficiency: "Using this information source takes much time."
- effectivity: "The information provided by this source helps me to make a very good investment decision."

Responses to the opening question, frequency of usage, were measured as seven point Likert items that ranged from "very little" (1) to "very often" (7) and featured an additional answer category of "never" to automatically filter out unused sources for subsequent questions. To further investigate the information search processes of the respondents (RQ2.2), we were also interested in their chronological *order* of information source usage. We asked the respondents to provide a temporal rank order of the sources they had indicated using (i.e., only those sources could be ranked to which the respondent had not attributed a response of "never", whereas not all sources had to be ranked).

6.3.5 Analyses

While the three phases represent our actual research process, they do not feature one-to-one relations to our research questions. Indeed, we investigated our phenomena of interests by concatenating findings of all phases and contextualizing the different perspectives. Answers to the individual research questions, however, put emphases on particular data collections. Below, we will present our general analyses of qualitative data (interviews and focus groups). We will then briefly discuss the combination of qualitative data and quantitative statistical analyses according to our research questions.

In general, the analysis of the semi-structured interviews with advisors, managers and IT managers followed the structure of qualitative content analysis [White and Marsh 2006; Mayring 2000]. We based our approach on thematic coding [Flick 2007:402], which is especially suitable to investigate predefined questions for predefined groups and compare them.

We proceeded as follows. All interviews were transcribed along the questions of the respective interview guide. For each interview, summaries of the respondents' answers were then consolidated in spreadsheets (one per stakeholder group), where columns related to questions and rows related to the single interviewee's answers.

Development of themes (categories) followed three basic steps, (1) analysis of single interviews, (2) analysis/comparison of all interviewees' answers per stakeholder group, (3) analysis/comparison of categories between stakeholder groups. In the first step, the single interviews were analyzed to identify central topics along the predefined themes with their corresponding questions. These topics were coded "openly", i.e., answer categories were not defined a priori but developed from the analysis; in doing so, each topic could be used as a "heuristic" for analyzing other interviews.

After the single interviews (i.e., rows in the spreadsheet) had been analyzed, in the second step categories of interest were compared for each question (columns) and related to each other, such that a general tendency or "theory" could be formulated. For the predefined theme of "advisory process", for example, identified topics in answers of questions like "What do you think of the advisory process?" could include "too restrictive", "does not match my work practice", "too generic to be of use" and, thus, may lead to the general thematic structure of advisors being skeptical towards advisory processes.

While analyzing and comparing the identified categories between interviews, the thematic structures evolved and were adapted, e.g., as individual

interviewees provided contradicting categories for particular questions (e.g., finding advisors that are "satisfied with the process and appreciate to have guidelines").
In the third step, we compared the categories between stakeholder groups, analyzing similarities and differences between advisors, managers and IT managers for our topics of interest. On this level, we also compared the categories with those found in our client focus groups to gain a comprehensive picture of the different perspectives.

Our analysis of the client focus groups was based on written discussions (documented by the electronic meeting system) as well as video-taped oral discussions. Similar to our interview analysis strategy, the interpretation of focus group discussions was related to thematic coding and categorizing, as also suggested by other researchers [see, e.g., review in Lunt and Livingstone 1996:94]. In doing so, we investigated the discussions per topic (e.g., satisfaction with advisory, quality of advisory process, information search behavior) and identified the general themes being focused in the different discussions. Since the written discussions were anonymized, we could not match oral and written statements of the participants. Instead, we compared and matched oral and written statements regarding their prevalent topics and themes.

RQ1.1 Our account on the stakeholder's perceptions and expectations of advisory services builds upon both quantitative and qualitative items regarding several dimensions of advisory quality, including the quality of the underlying advisory processes.
All stakeholder groups (clients, advisors, managers) responded a common set of quantitative items in interviews and online surveys, allowing us to evaluate differences of their responses regarding potential statistical significance. We conducted Kruskal-Wallis tests[14] to investigate differences of the stakeholder groups' assessments because responses to the scales were not normally distributed (according to Shapiro-Wilk tests; $p < .05$ for all variables). For every significant difference we conducted post-hoc analysis with Mann-Whitney *U* test[15] (two-tailed). To explore the differences between client expectation and experience along the employed scales, we conducted

[14] The Kruskal-Wallis test is the non-parametric equivalent of the one-way between-subjects ANOVA. It does not assume normal distribution of the dependent variable for each category of the independent variable.

[15] Mann-Whitney *U* tests are the non-parametric equivalent of independent t-tests and do not assume normal distribution of the compared data.

Wilcoxon matched-pairs signed-rank tests[16] (two-tailed), since Shapiro-Wilk tests had shown that the differences were not normally distributed ($p < .05$ for all variables).
All p-values were corrected for multiple hypotheses testing using the Benjamini-Hochberg procedure [Benjamini and Hochberg 1995]. The correction also accounted for the tests with non-significant results. For all variables revealing significant differences according to Mann-Whitney and Wilcoxon tests, we also calculated the effect size[17] to provide an objective measure of their importance.
The quantitative results of surveys are qualified and triangulated with our qualitative analyzes from focus groups and stakeholder interviews (see above), as well as observations from mystery shopping episodes.

RQ1.2 Our treatise on the role of IT in advisory processes and client-advisor encounters is mainly based on our observations from mystery shopping episodes as well as the IT-related questions in interviews and surveys. These qualitative data is complemented with quantitative measures on expectation and perception of IT usage – with the variables (and their differences, respectively) being significantly non-normally distributed (Shapiro-Wilk, $p < .05$ for all variables), the stakeholders' assessments again were compared using Kruskal-Wallis tests with post-hoc Mann-Whitney tests (two-tailed), and differences of client expectation and perception were evaluated using Wilcoxon tests (two-tailed). As for the other tests, we corrected the p-values for multiple comparisons (also accounting for non-significant results) and calculated the effect size r for significant differences.

RQ2.1 and RQ2.2 To investigate the information sources that FSP clients are accustomed to use to support their investment decisions, we performed a descriptive analysis of the measures introduced above. The frequency of usage and patterns of non-usage were analyzed using the mean of the respondents' rating of their source usage, filtering out information sources that the respondents indicated not using at all ("never"). As the performed Shapiro-Wilk tests showed them to be not normally distributed, we conducted Friedman tests to compare the respondents' ratings of information sources (in respect of accessibility, efficiency, effectivity, trust and

[16] The Wilcoxon matched-pairs signed-rank test is the non-parametric equivalent of the paired t-test without the assumption of normal distribution.

[17] $r = \frac{Z}{\sqrt{N}}$, where $r = .1$ is considered a small effect, $r = .3$ a medium effect and $r \geq 5$ is considered a large effect [Field 2009].

comprehensibility). Post-hoc analysis was conducted using Wilcoxon matched-pairs signed-rank tests with a Benjamini-Hochberg correction applied. The correction also accounted for the tests with non-significant results. For significant differences, we also calculated the effect size *r*.
We deduced the search process of the respondents from their indicated order of usage, which we evaluated for each source according to the rank it was assigned in the majority of cases. The number of information sources used by the respondents for making a decision on financial investments was calculated by counting the sources given for the order of usage.
As for the other research questions, we qualified and triangulated the results of our quantitative analyses with qualitative findings (here: discussion of information source characteristics in client focus groups).

6.4 Results

The results will be presented along the research questions discussed in Section 6.2.4. We commence with RQ1, which is concerned with the clients' expectations and experiences regarding investment advisory services and the quality of their processes (RQ1.1), their IT support (RQ1.2) as well as the FSP stakeholders' assessment thereof. We will then proceed with providing answers to RQ2 regarding the clients' preferred information sources (RQ2.1) and their information search processes (RQ2.2).

6.4.1 RQ1.1 What do Advisory Stakeholders Perceive and Expect from Investment Advisory Services?[18]

We will present the results on the quality of Swiss investment advisory processes along the constructs and metrics introduced in Section 6.3.4. First, we will discuss our findings regarding the perceived quality of advisory service processes and the clients' satisfaction with overall service provision. We will then turn to our results regarding the importance of particular dimensions of service quality, especially in respect of service personalization and assurance.

Quality of investment advisory processes. The majority of the 37 surveyed FSPs reported to have introduced standardized advisory processes (26 FSPs) in the past three years or that such processes were under development (2 FSPs). These processes mirror the generic advisory processes discussed in

[18] Data underlying this section has in parts been previously published in Mogicato et al. [2009] and Nussbaumer et al. [2009], whereas the results reported in this essay have been entirely reanalyzed.

the literature (see Section 6.2.1); their implementation, however, showed to be quite diverse. While some FSPs provide their advisors with checklists and non-binding guidelines, others have engineered process phases with strict standards of information gathering and processing.

According to our mystery shopping episodes, compliance with either of these processes seems to be rather low. Client needs and expectations were gathered and analyzed only in 9 of 21 episodes; only in 6 cases the advisor's analysis of the client's personal financial situation and risk profiling followed a structured process. Most of the mystery shoppers' negative remarks were related to this lack of incorporating and analyzing the client's situation and needs. Consequently, only in seven episodes the advisors evaluated whether the client's advisory goal had been reached.

These findings were confirmed in interviews with advisors and managers, who found various reasons for the lack of process acceptance. Advisors, for example, found the processes to be too rigid and restraining advisory practice – for some of them, the processes were impractical because their conception lacked inclusion of advisor input. Also, some advisors found the established processes to be insufficiently supported by IT (see also findings on RQ2.2 below). Managers, however, found that the main issue of current advisory processes was their lack of monitoring and enforcement.

In our mystery shopping episodes, we could also confirm the critique of potential interest conflicts discussed in the literature. Only in seven advisor encounters, the test clients found the advisor to perform a comprehensive check of their financial situation, whereas in seven episodes the emphasis was on product sale – in seven cases, the mystery shoppers were even indecisive of the advisor's strategy. Advisor competence, however, was found to be "very good" in the majority of cases (11 episodes), "good" in two episodes, "moderate" in four and "poor" in only two episodes (answers for two episodes missing).

In general, the mystery shoppers found that advisors put much emphasis on small talk, making up to 40% of the encounter's total duration, whereas less time was dedicated to needs gathering and analysis or solution recommendation. Also, all advisors provided their advice based on pen and paper, supported by brochures and fact sheets. IT was used by the advisor in only 6 cases – to look up exchange rates and print out further fact sheets. Dedicated advisory software was not used in any of the encounters.

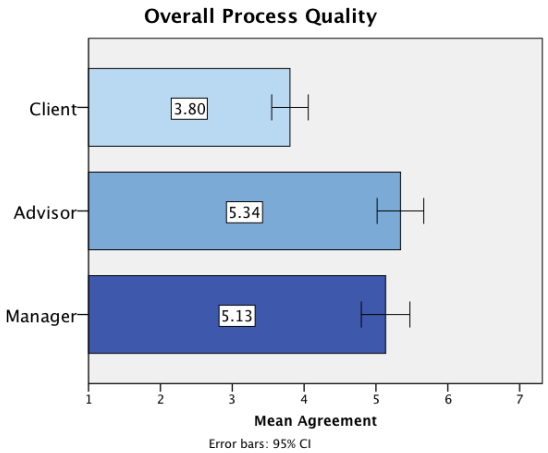


Figure 6-3: Client experience of advisory process quality (with estimations of advisors and sales managers)

Based on the observations regarding the established advisory processes, we were interested in how clients and FSP stakeholders would rate the status quo of advisory processes regarding their quality. Aggregated responses of clients, advisors and managers are presented in Figure 6-3. Note that advisors and managers assessed how they thought that their clients would respond to the specific scales.

The groups' assessments of advisory process quality showed significant differences (Kruskal-Wallis test, $\chi^2(2) = 37.800$, $p < .001$) and post-hoc Mann-Whitney tests found differences to be highly significant with medium to large effect sizes between clients and advisors ($U = 477.000$, $p < .001$, $r = -.49$) as well as clients and sales managers ($U = 747.500$, $p < .001$, $r = -.38$). Assessments of sales managers and advisors, however, revealed no significant differences.

Client satisfaction. Besides their assessment of the advisory process quality, we were also interested in the clients' overall satisfaction with investment advisory services as well as the FSP stakeholders' assessment thereof. As depicted in Figure 6-4, the clients showed low satisfaction with the FSPs' services. Quite to the contrary, FSP stakeholders believed that their clients were very satisfied – we found significant differences between the clients' and FSP stakeholders' assessments (Kruskal-Wallis test, $\chi^2(2) = 52.532$, $p < .001$). Post-hoc Mann-Whitney tests revealed that both the differences between clients and advisors ($U = 344.500$, $p < .001$, $r = -.44$) as well as

clients and sales managers ($U = 566.000$, $p < .001$, $r = -.45$) were significant with large effect sizes. The assessments of sales managers and advisors revealed no significant differences.

Regarding their satisfaction with advisory services, also the participants of our focus groups expressed mixed feelings – few positive aspects were raised, with one participant highlighting his advisor's kindness and concern with his own financial requirements, and another being impressed by his advisor's initiative, providing regular updates via e-mail. Yet other participants appreciated the advisor's feedback on the client's own investment ideas.

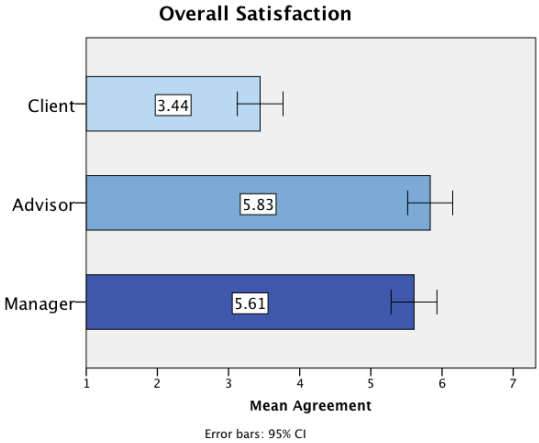


Figure 6-4: Overall client satisfaction with advisory services (with estimations of advisors and sales managers)

However, the majority of participants criticized their advisors as being very passive, inexperienced and lacking an in-depth understanding of the FSP's products. One participant even doubted that advisory services are meaningful at all, stating that "if the advisor knew how to make money, he would not be working as an advisor".

Some discussions also circled around the advisors' tendency to take advantage of uninformed clients, i.e., focusing on their own or the FSP's interests. While the focus group participants generally acknowledged that FSPs cross-subsidize advisory services with different fees and voiced their willingness to pay these in return for good advice, they criticized that the services lacked transparency regarding the exact costs; thus, they found it difficult to assess the cost-benefit ratios of advisory services.

The open discussion results were mirrored in the quantitative focus group surveys, in which only 35% of the focus group participants indicated that they would "highly recommend" their latest consultation.
In interviews with FSP stakeholders, we found that their systematic overestimation of client satisfaction was largely based on personal impressions of their own advisory practice or anecdotal evidence from others – almost two-thirds of the surveyed FSPs indicated that they did not measure client satisfaction; other FSPs declared to measure client satisfaction only irregularly and using informal modalities, e.g., by advisors inquiring the client's satisfaction at the end of the service encounter.

Dimensions of advisory quality. We asked clients, advisors and sales managers to weight the relative importance of the different SERVQUAL dimensions (reliability, assurance, responsiveness, empathy, tangibles; a total of 100 points could be allocated). The different groups' assessments are presented in Figure 6-5. Advisors and sales managers assessed the dimensions from their clients' perspective.

Clients found reliability to be the most important dimension, followed by trust and responsiveness. FSP stakeholders, however, expected significantly different client preferences for all but one dimension – responsiveness was evaluated similarly by all stakeholders. For all dimensions, FSP stakeholders showed very similar estimations of the clients' evaluation with no statistically significant differences.
Differences in the weighting of reliability (Kruskal-Wallis, $\chi^2(2) = 32.096$, $p < .001$), however, were significant with medium effect sizes between clients and managers ($U = 805.00$, $p < .001$, $r = -.38$) as well as clients and advisors ($U = 789.000$, $p < .001$, $r = -.29$). Weighting of assurance also showed significant differences between the groups ($\chi^2(2) = 13.294$, $p = .001$); both advisors ($U = 996.500$, $p = .014$, $r = -.20$) and managers ($U = 1240.500$, $p = .006$, $r = -.23$) evaluated the relative importance higher than the client respondents; effect sizes, however, were small.
The stakeholders' weighting of empathy (individual attention of the FSPs employees towards the clients) shows similar differences ($\chi^2(2) = 13.858$, $p = .001$), with advisors ($U = 944.000$, $p = .008$, $r = -.23$) and managers ($U = 1275.000$, $p = .008$, $r = -.22$) overemphasizing the importance of empathy as compared to their clients (small effect sizes). Finally, also the tangibles of advisory services are differently valued by the stakeholders ($\chi^2(2) = 10.393$, $p = .006$). Clients attach significantly less importance to this dimension than

advisors (U = 1004.000, p = .015, r = -.20) and managers (U = 1390.000, p = .025, r = -.18) – the effect sizes of these differences, however, were small.

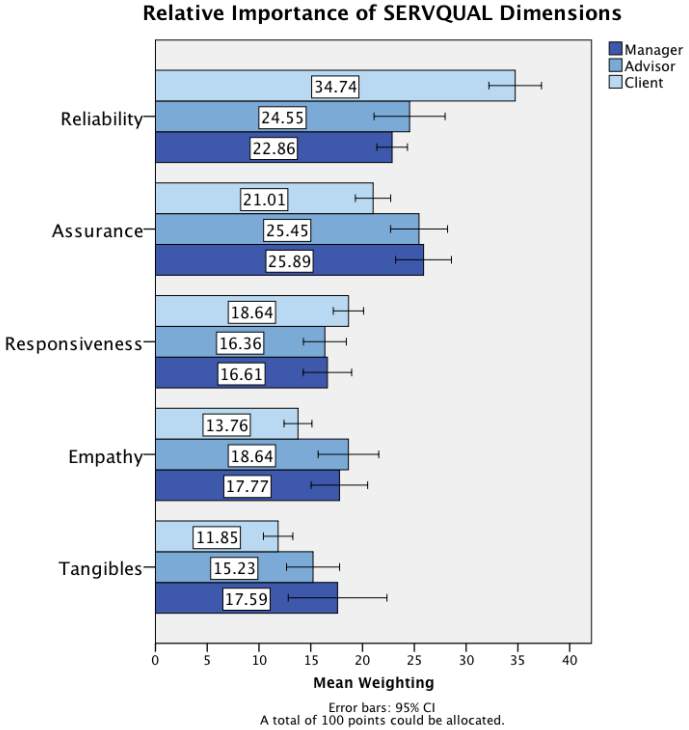


Figure 6-5: Weighting of relative importance of quality dimensions (with estimations of advisors and sales managers)

Personalization. In addition to the general weighting of service quality dimensions, many discussions in focus groups and interviews circled around the personalization and assurance of advisory services. As depicted in Figure 6-6, the client's expectation regarding personalized and client-oriented services is very high, approximately matching the FSP stakeholders' estimation. While the differences between the groups were statistically significant (Kruskal-Wallis, $\chi^2(2) = 12.654$, p = .002) with advisors (U = 810.000, p = .008, r = -.23) and managers (U = 1295.000, p = .015, r = -.20) estimating the client's responses lower, the effect sizes were small. Again, Mann-Whitney tests found no significant differences between the advisors' and managers' assessments. Concerning the significant differences between

client expectation and experience (Figure 6-7), effects were very large (Z = 8.539, p < .001, r = -.81).

In the focus groups, we discussed whether clients deemed advisory services to be personalized, i.e., tailorable to incorporate information of their individual requirements and preferences. Though some participants expressed strong interest in having such information incorporated, the majority of participants did not find that existing advisory services were individualized or personalized to their preferences or learning progress. Some participants even felt that advisors tended to shelve their clients and advise them according to some particular "category". Thus, they did not find that the advisor responded to their specific financial situation and needs but rather advised standard recommendations, leading to a perception of low influence on the process and its results.

As noted above, this perception was mirrored in the mystery shopping episodes: in only 9 of 21 episodes did the advisor attempt to obtain specific information on the client's needs, preferences and expectations. The obtained personal information, however, was focused on individualizing the outcome, i.e., investment strategies or products fitting the client's personal situation, and not on individualizing the information mediation according to the client's information need.

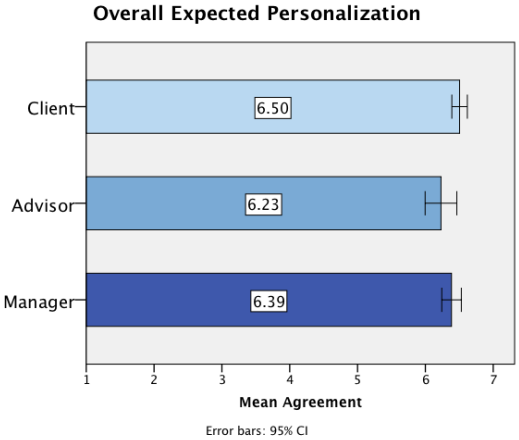


Figure 6-6: Expected personalization of clients (with estimations of advisors and sales managers)

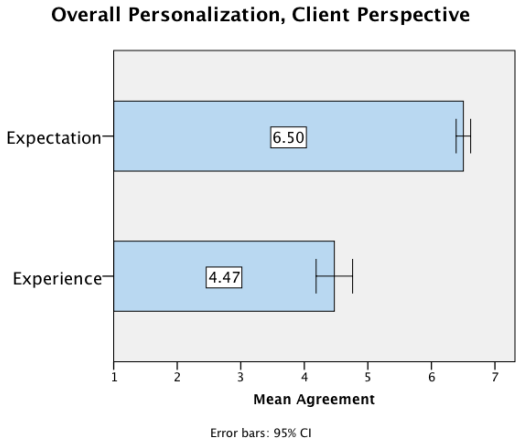


Figure 6-7: Client expectation and experience of advisory service personalization

Assurance. As already indicated in the general weighting of quality dimensions, the clients' expectation of assurance is high. Advisors and managers show very similar estimations (Figure 6-8).

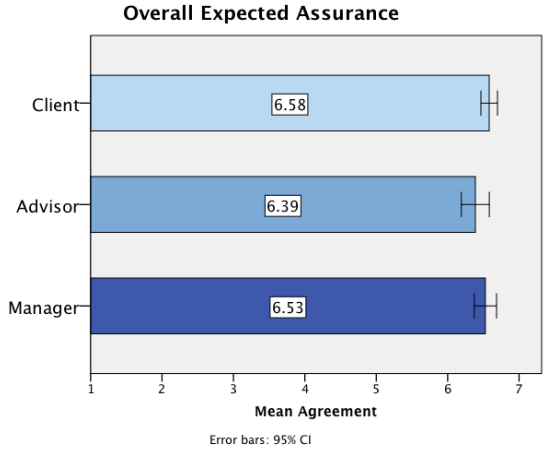


Figure 6-8: Expected assurance of clients

Even though we found statistically significant differences between the respondent groups (Kruskal-Wallis, $\chi^2(2) = 9.633$, $p = .008$), post-hoc Mann-Whitney tests revealed that only the ratings of clients and advisors were significantly different ($U = 864.500$, $p = .009$, $r = -.22$) with a small effect

size. To the contrary, the clients' expectation did not match their experience (Figure 6-9) – the Wilcoxon test revealed a significant difference ($Z = 8.523$, $p < .001$, $r = -.77$) with a large effect size.

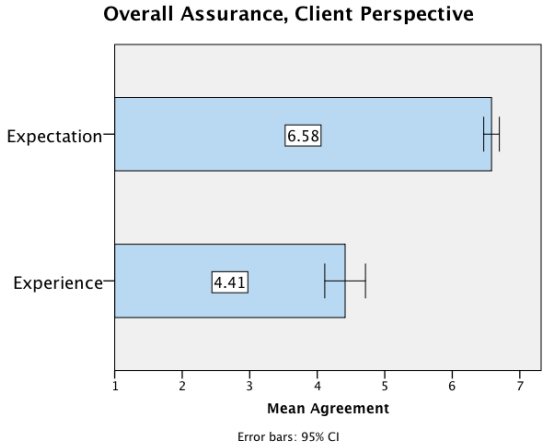


Figure 6-9: Client expectation and experience of advisory service assurance

Focus group participants found assurance and trustworthiness of advisory services low for several reasons; first, they criticized that clients could not discern their counterpart's real interests, i.e., whether the advisor acts on the client's behalf or pursue his own or the FSPs' interest. Indeed, in the interviews almost all FSPs indicated to provide their advisors with lists of recommended products. Being offered such recommended products, the client has to trust both the FSP (i.e., that recommended products do not only serve FSP self-interests) and the advisor (i.e., that he is actually recommending adequate products).

The client participants found the issue of trustworthiness to be aggravated by the advisory services' lack of transparency regarding the advisor's actions and activities. Clients tend to perceive the advisor as a "black box", not being able to comprehend how or on what basis advisors derive their recommendations.

In line with their high expectation of advisors recommending "adequate solutions", client participants also expected advisor to warn them against high-risk or imprudent investments, i.e., to sufficiently analyze the client's situation and risk profile prior to conducting transactions. Furthermore, they were disappointed with most advisors' inadequate information policy regarding negative developments of their portfolio.

6.4.2 RQ1.2 What is the Role of IT in Advisory Services?[19]

As observed in our mystery shopping episodes, the role of IT for supporting advisory service encounters is rather insignificant – if at all, available computers are primarily used to look up online information (e.g., exchange rates) or to print out further information material. This impression was supported by the interviews with FSP stakeholders. Advisors and sales managers indicated that FSPs provide several supportive IT systems in the back office – e.g., CRM systems to collect information on the interaction with clients or other systems to enforce compliance (e.g., in respect of money laundering laws). Indeed, those advisors of our mystery shopping episodes, who had prepared for the meeting, obviously had gathered their information from back office IT systems and brought a printout to the meeting.

Focus group participants voiced their disappointment regarding the lack of IT support and expressed a strong consensus that implementation of supportive IT would be useful, especially regarding decision support, e.g., providing visualization and simulation functionality as well as self-advice, e.g., applications supporting the client with her investment decisions over the Internet.

This general indication was supported by the online survey respondents (Figure 6-10).

[19] Qualitative results presented in this section were previously published in Schwabe and Nussbaumer [2009] and Mogicato et al. [2009]. Quantitative data were published in Mogicato et al. [2009] and have been reanalyzed for the essay at hand.

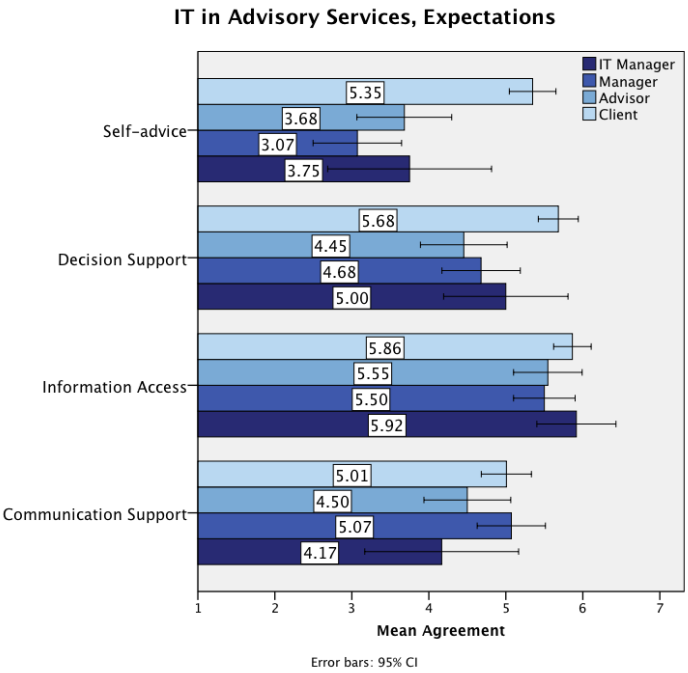


Figure 6-10: Client expectation of IT support in advisory services (with estimations of advisors, sales managers and IT managers)

Clients show rather high expectation of all surveyed IT support systems – while FSP stakeholders (advisors, sales managers and IT managers) mostly provided correct assessments of the client's expectations, gaps between client expectation and experience proved to be large (Figure 6-11).

Regarding communication support, i.e., FSPs supporting diverse communication channels for clients to contact their advisors, we found no statistically significant differences between stakeholder groups. Client expectation of such support, however, did not match their experience (Z = -4.650, p < .001, r = -.43) with medium effect size. Also, client expectation of information access (availability of up-to-date information in advisory encounters) was rated equally high by all stakeholder groups.

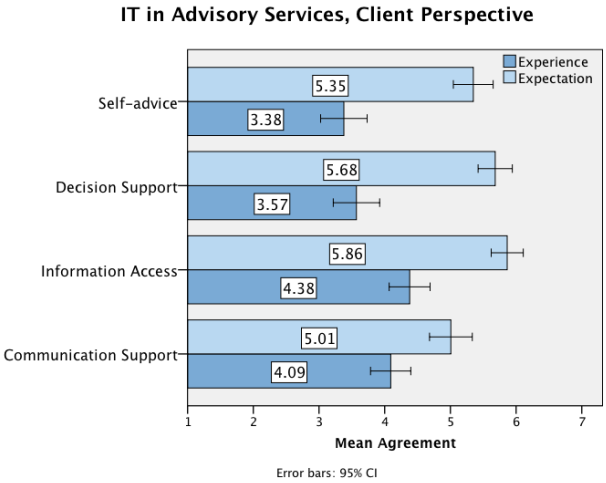


Figure 6-11: Client expectation and experience of IT support

Nevertheless, advisory practice causes a noticeable gap between client expectation and experience (Z = -6.454, p < .001, r = -.60) with large effect size.

Clients expect advisory encounters to be provided with decision support tools. Estimations of FSP stakeholders do not quite mirror such expectation (Kruskal-Wallis, $\chi^2(2) = 26.853$, $p < .001$), with significant differences between clients and advisors (U = 708.000, p < .001, r = -.32) as well as between clients and managers (U = 1040.500, p < .001, r = -.30). Differences between client expectation and experience again were significant with large effect sizes (Z = -6.919, p < .001, r = -.64).

Finally, clients also expect FSPs to support their information search and decision making outside advisory encounters with tools for self-advice. Again, FSP stakeholders do not show high awareness of such expectation ($\chi^2(2) = 44.716$, $p < .001$) and showing moderate differences between client and manager responses (U = 657.000, p < .001, r = -.43), clients and advisors (U = 656.000, p < .001, r = -.34) and clients and IT managers (U = 414.500, p = .005, r = -.23). Differences between client expectation and experience were large (Z = -6.898, p < .001, r = -.64).

While FSP stakeholders and especially IT managers seem to acknowledge the clients' expectation of IT support, our observations of advisory practice as well as the clients' experiences shows little evidence of FSPs trying to fulfill this demand. What are the reasons? In discussing IT support of

advisory services (especially in advisory encounters) with FSP stakeholders, we found a complex network of reasoning. Figure 6-12 provides an overview of the main arguments of different stakeholders [Schwabe and Nussbaumer 2009]; characterizations of the stakeholder's attitudes towards IT support are placed above and below the respective boxes, whereas the labeled arrows between boxes indicate stakeholders shifting responsibility to other stakeholders.

Clients. From our observations above, we can conclude that clients are generally open to IT support, also in advisory encounters. The focus group participants identified the visualization of information as a key feature to advisory encounters and particularly wished to be provided with enhanced means of comparison and scenario simulation. Furthermore, some participants found that the advisory process should become more transparent as for the client to be enabled to assess its quality. However, there were also critical voices of participants who found that the advisor should take care in not letting IT use replace personal conversation.

Advisors. In the interviews with advisors and other FSP stakeholders (sales managers, IT managers), we found that advisors are generally critical in respect of IT support. While older advisors tend to lack IT-affinity, younger advisors are not convinced of the provided systems' functionality and, in particular, their usability. Indeed, talking to the responsible managers, we found that IT tools are sometimes poorly integrated and therefore require advisors to use multiple tools, causing inconsistencies and redundancies. Only in few FSPs, which have established structured and stringent advisory processes with successful IT tool integration, do advisors conceive IT systems as supportive. However, advisors generally are critical regarding the controlling function of IT, allowing their supervisors to monitor their activities.

Most advisors do not feel confident to use IT in advisory encounters, i.e., in front or in cooperation with the client. They fear the loss of competence if problems appear – a fear fuelled by their experience of tools lacking stability and usability. Another major reason not to use IT in advisory encounters was the advisors' claim that clients do not want IT. They perceive investment advisory as "people's business", being personal and trust-oriented. In their opinion, using IT would endanger the client-advisor encounter and – as one advisor phrased it – "destroy the magic".

Sales managers. Sales managers are responsible for implementing and monitoring advisory services for advisors, and thus are part of the business

departments. In the interviews, we found that sales managers show a rather pragmatic attitude towards IT – given that powerful transaction systems are at the core of every FSP's infrastructure, they acknowledge IT's importance for the daily business – they do not think, however, of IT as being an appropriate means of differentiation, i.e., that they would add to competitive advantage and see IT as an "hygiene" factor.

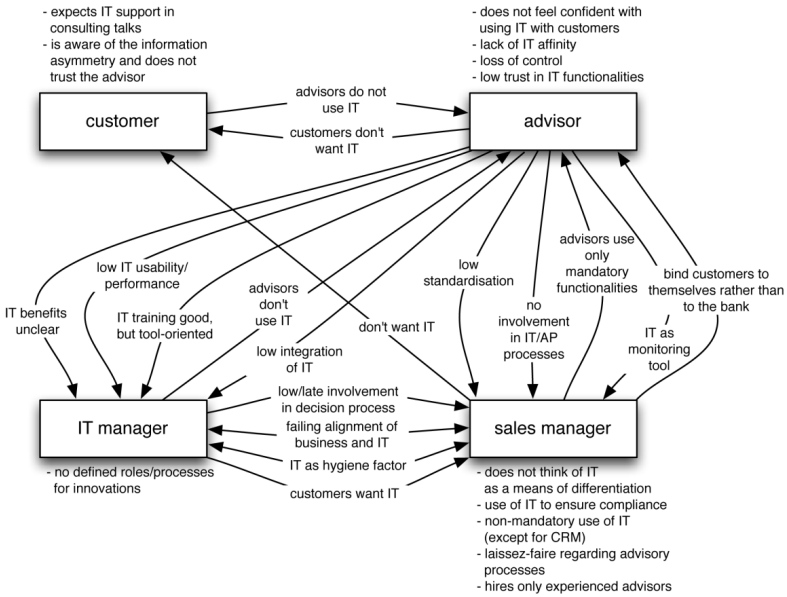


Figure 6-12: Overview of stakeholder arguments regarding IT support [from Schwabe and Nussbaumer 2009]

Sales managers confirmed our observations that advisors tend to only hesitantly use IT. They criticized that most advisors only use mandatory system functionality that ensures compliance with legal requirements. They also pointed out that there may be strong incentives for advisors to not overly use IT. In Switzerland, it is common practice (especially in private banks) that advisors take their clients along when joining another FSP. Hence, some sales managers suggested that it was in the advisor's interest to tie the client to himself rather than the FSP and its information system.

IT managers. IT managers were best at estimating the clients' expectation of IT support and shared the client's views regarding potential benefits. They

voiced their disappointment with the advisor's little and hesitant use of the laborious and expensive IT systems. Potential causes for this were found in the lack of alignment between IT and business departments, particularly regarding the IT managers' late involvement in decision processes for the design and support of advisory processes.

6.4.3 RQ2.1 What Information Sources do Clients Use and What is the Role of Investment Advisory Services?

We will present our findings in respect of this research question according to our main metrics of interest, i.e., the respondents' indicated usage of information sources as well as their assessment of the different sources' accessibility, trust, effectivity, inefficiency and comprehensibility.

Usage of information sources. The most popular information sources used by the survey participants are media (used by 99.3% of the respondents), professional Internet sources (96.5%) and personal environment (92.3%), whereas the usage of other sources is comparably lower, specifically for advisory services (see Table 6-7).

Looking at the frequency of usage (Figure 6-13), we find significant differences between the information sources (Friedman test, $\chi^2(6) = 80.926$, $p < .001$). Professional Internet sources are used most and significantly more often than any other information source – its frequency of usage is significantly different from media (Wilcoxon matched-pairs signed-rank test, $Z = -3.0349$, $p = .002$, $r = -.26$) with a medium effect size and also significantly different from advisory services in banks ($Z = -7.1146$, $p < .001$, $r = -.68$) and independent FSPs ($Z = -6.0009$, $p < .001$, $r = -.74$) with large effect sizes.

Table 6-7: Usage of information sources as indicated by respondents

Information source	*% of users*
media	99.3
professional Internet	96.5
personal environment	92.3
bank advice	79.6
guidebooks	77.5
informal Internet	76.1
independent FSP advice	48.6

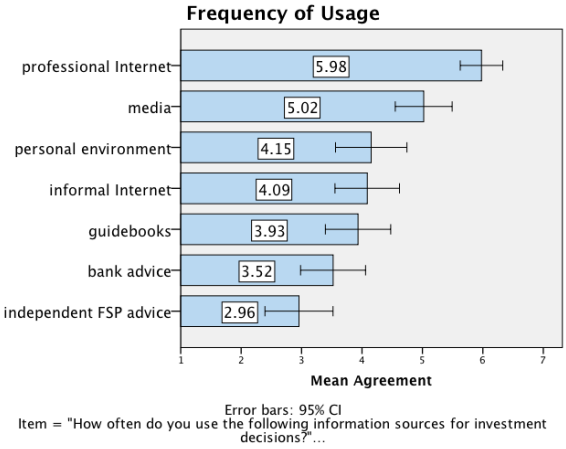


Figure 6-13: Frequency of information source usage

Media, which is used by the majority of respondents, was used very frequently by our respondents, followed by personal environment (used by most respondents), informal Internet sources and guidebooks. The frequency of using informal Internet resources was very diverse, with some respondents indicating a very high and others a very low frequency of use; there is, however, a notable difference to professional Internet sources (Z = -7.1893, p < .001, r = -.70) with a large effect size. Both advice provided by banks and independent FSPs are not used very frequently, whereby independent FSP advice was used by less than 50% of the respondents and shows the lowest frequency of usage. Consequently, the differences between advisory services of banks and independent FSPs were significant (Z = -3.2195, p = .001, r = -.39) with a medium effect size. A comprehensive list of all information source pairs and their differences regarding frequency of usage is provided in Table 6-13 in Appendix A2.

The participants of our focus groups showed a very similar pattern of most frequently using media, professional Internet and personal environment and using advisory services only rarely. While some participants used advisory services to get already "filtered" and therefore most relevant information, others stated to not use such services because their lack of credibility (see also results discussed above, RQ1.1). Furthermore, some found them inefficient regarding their overall duration.

Despite their high usage frequency, media like newspapers were not appreciated by all participants; some found them to be too facts-oriented or

lacking timeliness. Professional Internet sources were commonly used by focus group participants to get up-to-date information like exchange rates but also for comparison of FSP services and products; some participants mentioned that they use informal Internet sources (e.g., message boards and blogs) to investigate other investors' experiences.

According to the number of ranked information sources (from RQ2.2 below), the average respondent consults 5.7 information sources before making investment decisions, whereby more than 85% of the respondents use more than four information sources (Table 6-8) – this mirrors our focus group participants' conclusion that it was important to not rely on a single source and to not purchase the "first available offer". The survey respondent using only one information source relied on guidebooks. The usage profile of the respondents using three or more sources was very similar, with professional Internet sources, media and personal environment assigned to the top three positions, followed by informal Internet sources and advisory services in banks. However, as the number of information sources utilized increases, the assigned ranking of advisory services increases as well. Therefore, in terms of the corresponding order of use, both advisory provided by banks and independent FSPs consistently ranked amongst the last used information sources.

Table 6-8: Number of used information sources for decision making

No. of used sources	*No. of respondents*	*% of all respondents*	*Cumulative %*
1	1	0.7	0.7
3	8	5.6	6.3
4	12	8.5	14.8
5	36	25.4	40.1
6	39	27.5	67.6
7	46	32.4	100.0
Total	142	100.0	

Accessibility. The perceived accessibility shows a pattern similar to the frequency of usage, with professional Internet sources, media and personal environment having the highest average agreement on being accessible (Figure 6-14).The differences between the sources are highly significant (Friedman test, $\chi^2(6) = 266.634$, $p < .001$). Professional Internet sources were rated as being significantly more accessible than all other sources, with a small effect difference to the media ($Z = -2.3317$, $p = .03$, $r = -.20$), which are perceived the second most accessible source. Bank advice is also

considered significantly less accessible than personal environment (Z = -5.0163, p < .001, r = -.43) and informal Internet (Z = -2.7830, p = .008, r = -.25).

Advice provided by banks exhibits similar accessibility as guidebooks (no significant difference), which is also true for the frequency of usage. At the far end of the scale, we find independent FSP advice, which is also most infrequently used. It is perceived as significantly less accessible than any other information source, with large effect differences as compared to guidebooks (Z = -6.0509, p < .001, r = -.54), which rank the second least accessible source, as well as bank advice (Z = - 6.7980, p < .001, r = -.60).

Similar to their frequency of usage, the two different kinds of Internet sources show a significant difference regarding their perceived accessibility with a large effect size (Z = -6.4210, p < .001, r = - .57). Table 6-13 in Appendix A2 provides a comprehensive list of all significant differences of accessibility ratings. Focus group participants showed a very similar rating of information source accessibility, with professional Internet, media and personal environment found to be most accessible because of their "availability" and approachability.

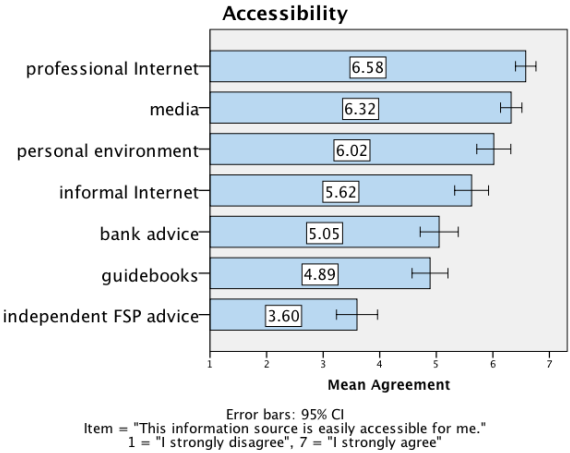


Figure 6-14: Perceived accessibility of information sources

Trust. Similar to other characteristics discussed thus far, the information sources with the highest perceived trust are professional Internet sources, media and personal environment (Figure 6-15). Again, the respondents provided significantly different ratings for the information sources ($\chi^2(6)$ = 117.634, p < .001). Respondents trust significantly more in professional

Internet sources than in media (Z = -3.6404, p < .001, r = -.31), whereas ratings of media and personal environment show no significant differences.
At the other end of the spectrum, bank advice attracts the lowest degree of trust. It is significantly less trusted than other information sources, except for informal Internet and independent FSP advice. Independent FSP advice shows a similar picture, being significantly less trusted than the most trusted sources of professional Internet, media, personal environment and guidebooks (see Table 6-14 in Appendix A2). Informal Internet sources are trusted significantly less than professional Internet sources with a large effect size (Z = -7.9458, p < .001, r = -.68).

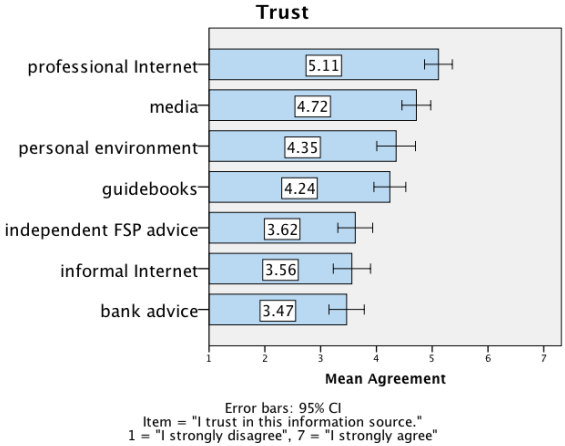


Figure 6-15: Trust in information sources

Again, the focus group participants similarly rated the different information sources, putting highest trust in professional Internet, media and personal environment. However, not all participants found these sources reliable – some participants especially questioned the utility and trustworthiness of personal environment (the third most frequently used information source), with one investor posing the following rhetorical question: "Why would family members and friends be more knowledgeable regarding investments?". Another investor, however, heavily relied on his retired father's recommendations – stating that his father had more time to gather relevant information than himself.

Effectivity. The respondents ratings of information sources in respect of effectivity were significantly different ($\chi^2(6) = 85.262$, p < .001). The highest

perceived effectivity is attributed to professional Internet sources (see Figure 6-16), which are rated significantly higher than the second-ranked media (Z = -3.1351, p = .003, r = -.26) with small to medium effect size. Effectivity of bank advice and independent FSP advice were rated equally low with no significant differences. Both were considered significantly less effective than the best rated professional Internet sources with large effect sizes (bank advice: Z = -5.8728, p < .001, r = -.51, independent FSP advice: Z = -5.9420, p < .001, r = -.55). Again, the perception of professional and informal Internet sources shows large effect differences (Z = -7.8796, p < .001, r = -.68). Similar ratings were provided by our focus group participants. Advisory services as well as informal Internet sources were not considered to support investors in making good investment decisions mainly because their lack of credibility and trust (see similar results for RQ1.1).

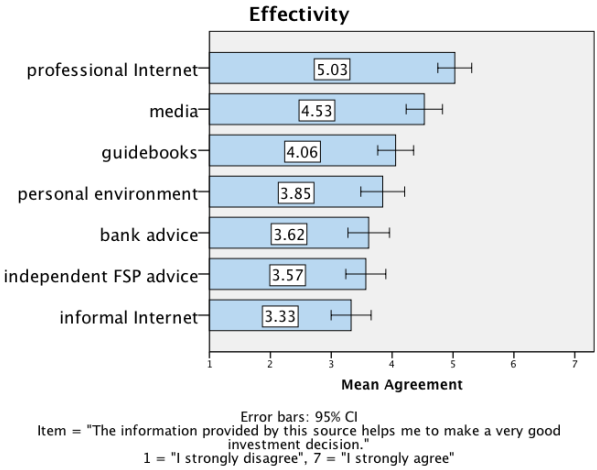


Figure 6-16: Perceived effectivity of information sources

Inefficiency. Regarding the perceived inefficiency of the information sources used (Figure 6-17), ratings again are significantly different ($\chi^2(6)$ = 186.975, p < .001). The three best-rated (i.e., with lowest agreement) sources again were personal environment, professional Internet sources and media, which so far have shown the highest frequency of use and accessibility (see above).

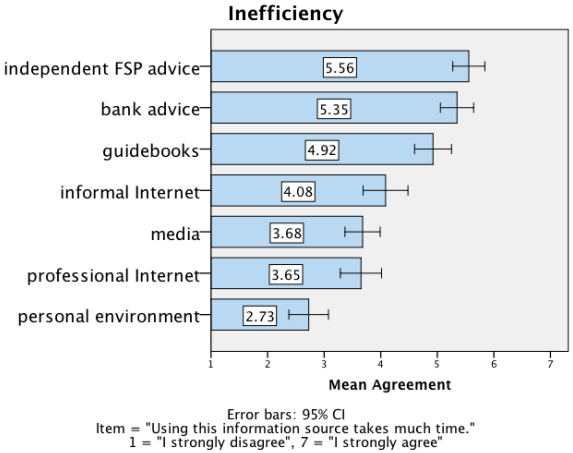


Figure 6-17: Perceived inefficiency of information sources

Differences between personal environment and professional Internet were highly significant with medium effect size (Z = -3.6090, p < .001, r = -.31). Independent FSP advice as well as bank advice show the highest average rating of inefficiency with a small but significant difference (Z = -2.7728, p = .008, r = -.25). The inefficiency of informal Internet sources is rated significantly lower than for guidebooks (Z = -3.1308, p = .003, r = -.29) as well as the subsequent sources (see Table 6-15 in Appendix A2).
Responses of focus group participants largely conform to those of the online survey. While they also generally found professional Internet sources to be very efficient, however, some found them tedious for finding useful information because of missing functionality to filter relevant information.

Comprehensibility. The different information sources are perceived as significantly different regarding their comprehensibility ($\chi^2(6)$ = 40.685, p < .001). Highest rated information sources are professional Internet, personal environment and media with no significant different ratings between them. Media is considered significantly more comprehensible than guidebooks (Z = -3.5072, p < .001, r = -.32) and all following information sources (see Table 6-14 in Appendix A2), including bank advice and independent FSP advice, which are not rated significantly different. Ratings of informal and professional Internet, however, show significant differences with large effect size (Z = -5.2688, p < .001, r = -.47).

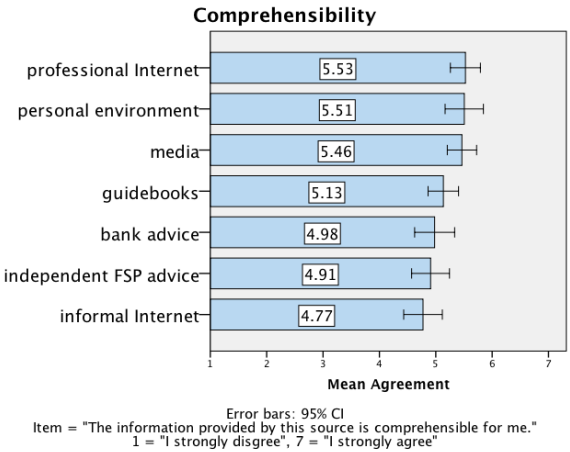


Figure 6-18: Perceived comprehensibility of information sources

In our focus group discussions, many participants found advisory services to be particularly lacking comprehensibility in respect of the advisor's not sufficiently explaining their activities and actions and overly using technical terms.

6.4.4 RQ2.2 What are the Clients' Information Search Processes and What is the Role of Investment Advisory Services?[20]

To investigate the clients information search processes, we asked the respondents to rank the sources according to their temporal usage order. We deduced the order of usage for each source according to the rank it was assigned in the majority of cases. Results show that the respondents start their information search using impersonal sources (professional Internet sources, media), and turn to personal sources (like their personal environment or advisory services) only later in the process.

This usage pattern can be found equally for customers frequently, infrequently or never using advisory services provided by banks. Table 6-9 presents the detailed results, where the temporal rank orders are shown for respondents "not using bank advice" (usage frequency: "never"), "infrequently using bank advice" (mean usage frequency lower than 4 on the seven-point Likert scale) and respondents who report a high usage of these services (mean usage frequency greater than 4). To analyze the obtained data we evaluated the ranking of each source given by the majority of

[20] Results presented in this section are based on Nussbaumer et al. [2011].

respondents. Two information sources may therefore share the same rank – e.g., for respondents not using bank advice, the third rank was chosen by the majority of respondents for both personal environment and guidebooks. In this case, another rank is missing, because only respondents who had indicated to using bank advice are represented.

Table 6-9: Usage order of information sources in respect of bank advice usage

	Rank order of source usage...		
	*... if **not using** bank advice*	*... if **infrequently using** bank advice*	*... if **frequently using** bank advice*
1	prof. Internet	prof. Internet	prof. Internet
2	media	media	media
3	personal env. & guidebooks	personal env.	personal env.
4	informal Internet	informal Internet	bank advice
5	-	guidebooks	-
6	independent FSP advice	bank & independent FSP advice	ind. FSP advice & inf. Internet
7	-	-	guidebooks

While our focus group participants provided similar usage orders in the quantitative surveys, their results were not discussed with the participants and therefore leave no further qualitative explanations other than the findings regarding other information source characteristics reported above.

6.5 Discussion[21]

Even though FSP stakeholders correctly estimate their clients' expectations, they do not succeed in satisfying them. Hence, clients find investment advisory services unsatisfying – with FSP stakeholders seemingly being unaware of their services' poor reputation.

Expectation and experience of advisory service quality. Client expectation of service quality is very high, with the all mean quality expectation ratings being greater than 6.4 on a seven-point scale. In none of the dimensions, however, did the clients' experience match with their expectation – while FSP stakeholders estimated the clients' expectations rather accurately, advisory practice does not seem to sufficiently address them. Furthermore, regarding the relative importance of the basic quality dimensions (reliability, assurance, responsiveness, empathy, and tangibles), FSP stakeholders do not seem to understand the client's value systems. In general, clients of investment advisory services seem to put more emphasis

[21] Interpretation of information behavior results is based on Nussbaumer et al. [2011].

on "hard" factors rather than "soft" factors: for them, the most important dimension is reliability, i.e., correct and dependable service performance; this dimension has been repeatedly found to be the most critical dimension, regardless of the service domain [Zeithaml et al. 1990:27].
Advisors and managers, on the other hand, aim at improving "soft" dimensions like empathy and assurance – or even the advisory services' tangibles (appearance of facilities and personnel) that was considered least important by investor clients, similar to investigations in other domains [Zeithaml et al. 1990:28].
From our observations in mystery shopping episodes, we were not surprised that clients found service quality being rather low. The contrary beliefs of FSP stakeholders, however, are striking and point to severe and also *collective* – given the stakeholders' mostly concordant estimation of client expectation and experience – gaps in their perception. This may provide some explanation to our introductory question of why FSPs are not addressing the clients' concerns – they do not seem to be quite aware of them. Given that two-thirds of the surveyed FSPs have not established structured and regular means of measuring client satisfaction, this lack of awareness seems not too surprising.
Looking at the clients' critiques, we find that investment advisory services of Swiss FSPs – despite their reputation – face the same issues previously discussed for investment advice of German and other European FSPs [e.g., Hackethal et al. 2012; Jungermann and Belting 2004; Oehler and Kohlert 2009] (see also Section 6.2.1). Our surveyed clients' dissatisfaction is related to the following aspects:

(1) **Lack of personalization and customer orientation**: Clients may use advisory services for several reasons, like superior advisor knowledge and experience, aggregated information provision or increased efficiency – in general, they seem to expect advisory results that are superior to making investment decisions on their own. In our investigations, we found that investors also expect advice to be reflecting their specific situation and needs. FSP advisory practice, however, does not match these expectations. Few FSPs have implemented structured processes and guidelines to establish such customer orientation. Consequently, though clients voiced their need for adapting advisory services to their requirements and preferences, few found that advisory practice fulfilled their needs. Thus, clients found that advisors often shelved them into categories and provided "standard" advice, on which the client had little control. This was also matched by our observations in mystery shopping

episodes, where only in 9 of 21 encounters the advisor even tried to obtain information on the client's situation, needs and preferences.

(2) **Low assurance**: Overall, professional investment advice is not deemed very assuring and trustworthy, even more so in comparison to other client information sources (see below). Clients find that their advisors are not particularly knowledgeable about the products they provide or the financial markets in general. Furthermore, they are aware of potential conflicts of interests stemming from the prevalent business models of cross-subsidizing free-of-charge advisory services with product costs – some clients explained that they generally do not trust the advisor to really act on the client's behalf. Consequently, clients are not convinced that their FSPs advisory process leads to a very good decision. This is surprising all the more given the FSP stakeholders' exceedingly high estimation of their clients' expectation on assurance.

(3) **Lack of transparency**: Problems of low assurance based on immanent conflicts of interests are further aggravated by the client's perception of information asymmetries. Clients tend to perceive their advisor as a "black box" – neither the underlying process (advisor activities and actions) nor the information provided are deemed very comprehensible. The issues of lacking personalization and client control as well as low assurance may also be related to this lack of transparency – even in actually individualized service encounters it would be difficult for the client to acknowledge such individualization if she cannot comprehend what the advisor is trying to accomplish. Given the potential conflicts of interest, such a lack of comprehensibility may also affect the client's perception of assurance and trustworthiness. In this regard, transparency of costs has been discussed quite controversially, with clients criticizing that FSPs were reluctant to disclose exact costs of the advisory services and their products, respectively.

Advisory services and IT. Our investigation of the status quo of IT usage in Swiss investment advisory services soon gave way to an investigation of IT *non*-usage. Indeed, in none of our surveyed FSPs did IT play a significant role for investment advice. While major FSPs provide their advisors with CRM-oriented software solutions to prepare and document client consultation, they are – if ever – mostly used outside the actual advisory encounter; except for sporadic use of IT to print fact-sheets or retrieve exchange rates. Collaborative support systems developed and recommended by CSCW research for similar advisory domains [e.g., Novak and Schmidt

2009; Rodden et al. 2003] have not been established in any of the surveyed Swiss FSPs.

In respect of little IT support and usage in advisory processes and IT's virtual non-existence in advisory encounters, the stakeholders provided us with manifold, however sometimes contradictory arguments. Clients expressed high expectation of IT support – also for advisory encounters, in order to increase comprehensibility and transparency, e.g., through enhanced means of comparison and simulation. Their expectation does not seem to correspond with their experience. Advisors and sales managers, however, expect clients to be very critical towards IT usage in advisory encounters, stating that their clients "don't want IT" – while some client participants of our focus groups actually warned that exceeding IT usage might interfere with personal advisory atmosphere, both the discussions and online surveys point to very positive client attitudes towards IT. So far, only IT managers seem to acknowledge the client's expectation and valuation of IT support.

What could be the cause of these perceptive gaps between the FSP stakeholders? In our investigations, we found the stakeholders' perceptions being influenced by their particular roles and interests. For sales managers, IT tools are not considered a means of differentiation but a means of enforcing compliance and monitoring advisory processes. Thus, business representatives tend to put little attention to improvements of IT support and insufficiently involve IT managers in their decisions. In our interviews, sales managers were not convinced of benefits of IT in advisory encounters. As advisor voice no specific demand, sales managers do not push the development of further advisory support systems.

This seems to support the advisor's ambiguous attitudes towards IT. In our interviews with advisors, we found several IT-related issues other than their clients' alleged objection against IT support. Advisor acceptance of IT seems to be strongly related to software quality. Some advisors pointed to the lack of tool integration, while many respondents emphasized on the lack of usability. This lack of trust in IT functionality also seems to pose a great barrier to IT use in advisory encounters – advisors do not feel confident in using software with clients and fear a loss of control in case of system malfunctions. A more general barrier to IT usage can be found in the information and interest asymmetries between advisors and their FSP. Using only the little mandatory functionality of IT systems allows advisors to constrain supervisors in monitoring their activities as well as keeping back client information in order to bind them to themselves rather than the FSP and its information systems.

Information behavior and the role of FSP advice. Besides FSP advice, investors are accustomed to using a wide variety of information sources to gather investment-related information. The majority of respondents used media (99.3%), professional Internet sources (96.5%) and personal environment (92.3%). Advice from banks indeed is also being used by most respondents (79.6%), however, much less frequently. Analyzing the perceived characteristics of the different information sources, we find the recurring pattern of professional Internet sources, media and personal environment being top-rated. For advisory services – provided by banks and or independent FSPs – the respondents show a contrary perception of the surveyed characteristics. Compared to other information sources, advisory services are perceived to be rather inaccessible (with services provided by independent FSPs showing the significant lowest accessibility), inefficient and ineffective. Furthermore, advisory services also rank amongst the least trusted information sources. These ratings are compatible with our investigation of advisory quality issues discussed above.

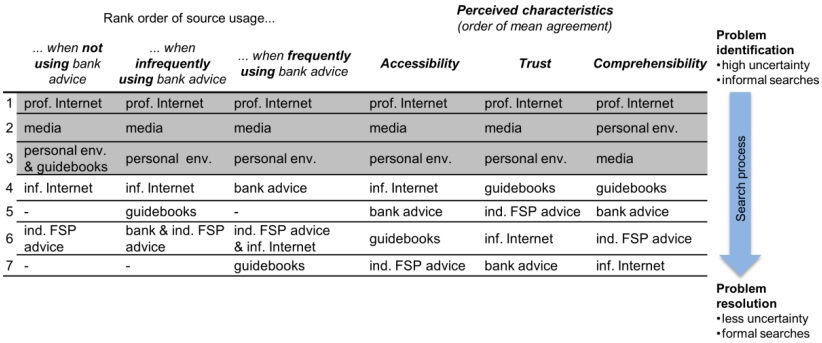
For the order of usage of information sources, we find that the respondents of our survey exhibit very similar search patterns. Our survey findings point to a high amount of successive searches, with more than 85% of the respondents indicating to successively use more than four information sources for investment decision making. In respect of their arrangement, clients seem to adopt the principle of least effort [Case 2005], proceeding from the most accessible to the least accessible information sources. Also, the first sources to be used (personal environment, professional Internet sources, media) are also perceived as being the most efficient, effective and comprehensible information sources. In respect of trust, we find a similar pattern – in their search process, investors start with the most trusted and progress with less trusted sources. Possibly reflecting the agency conflicts between advisor and client, advisory services provided by banks are the least trusted source and used only later or even as the last sources in information search. As observed by Julien [1999] in the domain of career decision making, such low trust may also negatively affect the perception of advisory's helpfulness or effectivity.

In terms of the search process, our respondents generally progress from rather untargeted, informal searches (using professional Internet sources, media, personal environment) to more targeted, formal searches (using more specific sources like advisory services or guidebooks). The first sources used in the process support search modes that are more suitable for the initiation of information search, as well as the selection and exploration of information

sources. In terms of problem resolution, however, it seems that investors turn to advisory services, whereas the definitive investment decision solution may be preceded by some validation of the information search results (using informal Internet sources or guidebooks). Such a behavior is illustrated by Kuhlthau's [2004] concept of uncertainty, in which the use of information sources (such as advisory services) may not necessarily reduce but rather increase uncertainty.

Thus, the late usage of advisory services may be connected to the individual's problem-resolution process [Wilson 1999]; in the problem identification and definition phase, the individual opportunistically uses multiple sources in order to enhance her understanding of the problem. Only when she has reduced her uncertainty to a degree that allows for an articulation of the search problem or even possible solutions, the investor turns to advisory services. Individuals never or only infrequently using advisory services in banks (indicated by their frequency of use) seem to employ any available information source before electing to turn to (independent) advisory services, maybe to validate their knowledge and possibly implement their investment solutions – as a matter of fact, such an integration of advice and solution implementation is common for Swiss FSPs. Frequent users of bank advice use these services directly after having employed the top three sources (professional Internet sources, media, personal environment) and turn to other sources only later (informal Internet sources, guidebooks). This might also imply an attempt at validation of the outcomes of the advisory experience. Thus, advisory services are not necessarily used infrequently and late in the search process only because of the perceived low quality – in fact, frequency and order of information source usage may be attributed to the investors' search process which converges from informal searches to formal, targeted searches. As such, advisory services seem to be attributed a closure role in information search, marking the exit rather than the entry point to information search. This equilibrium seems to be suboptimal as human advisors in the role of a personal source are superior to other information systems in that they have a unique ability to uncover hidden information needs [Ellis et al. 2002] – an activity most needed in the early phases of the information search. Thus, applying their services early in the information search process could greatly enhance the efficiency and effectiveness of any subsequent information search activities. To commend themselves as "early" information sources, however, advisory services clearly would have to be improved, especially

regarding their accessibility, comprehensibility and trustworthiness. We will discuss potential approaches to such improvements in Section 6.6.
Figure 6-19 summarizes the discussion by showing the association of the order of source usage and the ratings of their characteristics; additionally, it contrasts the succession of information sources with their suggested search process phase.



	... when **not using** bank advice	... when **infrequently using** bank advice	... when **frequently using** bank advice	**Accessibility**	**Trust**	**Comprehensibility**
1	prof. Internet	prof. Internet	prof. Internet	prof. Internet	prof. Internet	prof. Internet
2	media	media	media	media	media	personal env.
3	personal env. & guidebooks	personal env.	personal env.	personal env.	personal env.	media
4	inf. Internet	inf. Internet	bank advice	inf. Internet	guidebooks	guidebooks
5	-	guidebooks	-	bank advice	ind. FSP advice	bank advice
6	ind. FSP advice	bank & ind. FSP advice	ind. FSP advice & inf. Internet	guidebooks	inf. Internet	ind. FSP advice
7	-	-	guidebooks	ind. FSP advice	bank advice	inf. Internet

Figure 6-19: Usage order of information sources in context with their characteristics and the search process [adapted and extended from Nussbaumer et al. 2011]

We will conclude the discussion of investor information seeking behavior with some general considerations in respect of the different usage of professional and informal Internet sources as well as a brief comparison of our findings with those of other related surveys.
Looking at the seeming importance of professional Internet sources, we find that the "Internet revolution" might indeed have considerably influenced or even changed the information behavior of individuals. Interestingly, this does not apply for informal Internet, i.e., the information sources of the Web 2.0 (online communities, blogs, etc.). Compared to professional Internet sources they fall short regarding frequency of usage as well as in their perception of accessibility, trust and effectivity. As we can therefore see, the Internet is still not the panacea to information search.
For the use of press and other media, our findings are consistent with the usage of information sources reported in Cocca et al. [2009], where 74.7% of the respondents cited the press as the principal source of information on investment issues, and Ernst et al. [2009], where 75% indicated a high reliance upon newspapers, magazines and TV. Compared to our results, the study of Cocca et al. suggests a similar usage of advisory (69.1%), but a considerably less frequent usage of Internet sources (54.9%) and personal environment (38.3%). In the study of Ernst et al., only 40% of the

respondents considered advisory as (very) important, whereas the Internet (26%) and the personal environment (16%) are considered important by many fewer respondents. These differences are possibly based on the diverse samples of respondents. While our study addressed affluent clients of Swiss FSPs, Cocca et al. targeted the information source use of Swiss private banking clients, and Ernst et al. considered information source usage of German shareholders. As such, the latter survey also included retail investors, for which Cocca et al. [2009] found different information source usage as compared to affluent or "private" investors.

6.6 Implications and Conclusions

In the introduction, we posed two initial research questions; (1) *What are the clients' expectations and why do FSPs fail to meet them?* and (2) *What is the role of investment advisory services and what alternatives do clients employ?*

In respect of the first question, we found that client expectations are high in any surveyed dimension (personalization, assurance, IT support). While FSP stakeholders provided approximately correct estimations of these expectations, they did not seem to be aware of the actual client experience and overestimated their satisfaction. This lack of awareness – furthered by missing instruments of measuring advisory quality – might be one reason of FSPs to fail to meet the clients' expectations, e.g., in respect of requested personalization and client orientation. Other sources of dissatisfaction, however, can be found in the inherent issues of advisor-client interactions, namely the information and interest asymmetries between the parties. Information asymmetries are a general feature of encounters between laypersons and experts, where the former requests help from the latter. In investment advisory services, however, these are aggravated by poor information exchange, where clients find it difficult to follow the advisor's actions or even comprehend the provided information. Interest asymmetries relate to the potential conflicts of interests between the actors (which are furthered by the FSPs prevailing business models), where the advisor might be incentivized to take advantage of the less informed client. Such asymmetries affect assurance and trustworthiness of investment advisory services.

If investment advisory services provide are dissatisfying, what is their actual role in client information search and what alternatives do they employ? Our investigation of this second research question revealed that clients actually do not make exceeding usage of FSP advice. We found that they are

accustomed to use a multitude of alternative information sources to support their investment decisions, with professional Internet sources, media and personal environment being the most frequently used and top-rated sources. FSP advice, on the contrary, is perceived as rather inaccessible, inefficient, and ineffective as well as lacking trust and comprehensibility. Looking at their information search processes, most clients use FSP advice at some point of time; mostly, however, they use them very late in the search process, making them an exit rather than an entry point of information search. One reason for this can be found in the fact that, in Switzerland, implementation of investments and according transactions typically require interaction with a FSP and an investment advisor, respectively. Thus, clients possibly employ other information sources prior to advisory services as a compensation for their lack of comprehensibility and assurance.
Overall, these premises lead to an unsatisfying equilibrium. Firstly, FSPs fail to satisfy their clients, which in turn might affect client retention – clearly, they therefore miss the opportunity of differentiating themselves from competitors by providing unique, personalized advisory services that are difficult to imitate [Buhl and Kaiser 2008]. On the other hand, possibly due to the negative aspects of FSP advice, clients use advisory services only infrequently and late in their information search process; they therefore fail to reap the beneficial effects of personal information sources in the early phases of problem identification, including the reduction of uncertainty and personalized information aggregation.

To achieve an equilibrium that is more satisfying for FSPs and investment advisory clients, we suggest the following steps in improving advisory services and their encounters.
Firstly, FSPs should not only reconsider their conceptions and implementation of advisory processes but also the assessment of their quality. Our findings point to large perceptive gaps of advisors and sales managers regarding the advisory quality and client satisfaction. One major reason for this situation was found in many FSPs' practice of only irregularly and informally surveying their clients' satisfaction. Thus, in order to better estimate their clients' expectation-experience gaps, FSPs should introduce regular, structured measurements of satisfaction and advisory quality.
Secondly, in order to provide the most benefit for the client as well as differentiate against competitors, FSPs should strive to position their advisory services as entry points of an investor's information search. For this, however, prevailing issues of low accessibility as well as the lack of personalization, assurance and transparency have to be adequately addressed.

To increase accessibility, FSPs should encourage their customers to seek their advice also in early phases of their investment decision making, helping them to define their problems and reduce their uncertainty. Considering the successive searches of their clients and their particular combination of information sources, FSPs could address and positively influence their media choice, e.g., by providing appropriate information in different channels. We also suggest that FSPs put more emphasis on their Internet presence, which should better support their customers' identification and definition of financial problems during informal, unstructured searches. This could greatly improve the accessibility of FSPs services, with interactive tools offered at web sites helping clients to identify their needs, which could then be further discussed in noncommittal advisory conversations.

Furthermore, the current issue of low assurance and trust based on immanent interest asymmetries has to be addressed. This might indicate the need to separate advisory services from the investment solution's implementation – this could alleviate agency conflicts and lead to increased trust in advisory services. Furthermore, this separation would relieve clients from advisors' potential incentives to base his recommendations on considerations of earnings and provisions. At the same time, such an approach could also alleviate the related issues of cost transparency.

Finally, information asymmetries and the client's perceived lack of comprehensibility and transparency should be addressed. As discussed above, CSCW research has already pointed to great potential of information technology in mediating collaborative solution-finding processes. For asymmetric advisory settings, the provision of shared, collaborative information spaces could greatly improve client-advisor interaction [Nussbaumer and Schwabe 2010]. Such shared information spaces could mediate advisor-client interaction by providing relevant information regarding advisory content, activities and costs. This could improve comprehensibility and transparency of advisory encounters, while possibly restricting the advisor to engage in hidden information and hidden action and thus alleviating issues arising from conflicts of interest.

Such IT support could also allow for cooperative exploration and modeling of the client's problem space and enhance her understanding through appropriate visualizations and simulations. Thereby, IT could support the client's information search and decision-making process and allow for improved consideration and incorporation of the specific client situation and requirements.

Regarding the client's information source preferences, IT-enabled shared information spaces could allow for the inclusion of popular and trusted information sources. For example, IT could be used to supplement advisory encounters with information sources that clients find effective, comprehensible and credible. This could allow for transparent information aggregation in the advisory encounter already in very early search phases of the client, thus also increasing the efficiency and effectivity of her overall search process.

However, as we may deduce from our investigation on current issues of IT usage in investment advisory services, such IT systems also pose several requirements from the advisor's and organization's perspective. To further their acceptance, IT tools must be tightly integrated in advisory processes and existing IT infrastructure. They should avoid necessity of using multiple applications in order to reduce inconsistencies and redundancies, also improving the advisor's efficiency. Especially in respect of using shared information spaces with the client, usability and user experience seems to be of utmost importance and highly related to non-usage. If adequately implemented, such systems could also improve the effectivity of the advisor's recommendations in that they may increase comprehensibility for the client and positively influence trustworthiness and client satisfaction. Only if they are convinced that the proposed advantages of IT exceed the potential disadvantages (reduction of information asymmetries towards both the clients and the FSPs), will advisors be willing to use them.

Limitations. As with any exploratory research, our results and their interpretation may be generalized only with caution. While we were able to talk to sales managers, advisors and IT managers of all major Swiss FSPs, the surveyed institutions showed great diversity. Thus, the arguments given by a particular interview partner may be specific to the respective FSP and may not hold true for any other FSP. However, we were surprised about the coherency of their arguments across different FSPs.

Also, the number of client respondents of our online surveys was rather small and informative only for customers of the affluent segment (or above) of the Swiss banking region. However, our observations and conclusions regarding the general problems of investment advisory services show high consistency with similar research in other financial markets.

The representativeness of our sample may be limited by their acquisition – the respondents were acquired through an online finance newspaper and through targeted e-mailing in the researchers' environments. Thus, the respondents may show higher financial literacy and/or experience than

average clients. Also, using online surveys implies a sample bias in the participants' evaluation of Internet information sources usage – the indicated high average use of these sources could therefore also be attributed to the online survey's implicit exclusion of individuals infrequently or not using the Internet at all.

Regarding our results on client information behavior, another important limitation is that we measured the participants' perceptions of their information search activities rather than their actual use of different information sources. Thus, higher scores may also reflect the perceived intensity of the specific information-gathering task [Laroche et al. 2004].

Finally, another potential limitation stems from the time period in which the data collection took place. As the focus groups, interviews and online surveys were conducted from May to Oct 2008, we cannot isolate potential effects of the financial crisis that was emerging at the time. This crisis may have biased especially the clients' assessment of service quality. However, consistent with prior (pre-crisis) investigations of the field, we found that the clients' attitudes towards investment advisory services point to substantial problems in client-advisor relationships that are seemingly independent from short- or middle-term developments of financial markets.

6.7 Appendix

A1. Client Sample Profiles

Table 6-10: Profile of sample of client focus groups

		Focus Group 1 (*N* = 17)	**Focus Group 2** (*N* = 11)
age		31-45 years (*M* = 35.82 , *SD* = 3.76)	25-53 years (M = *37.36* , SD = *8.77*)
gender	female	5.9%	18.2%
	male	94.1%	81.8%
education	university degree	100%	100%
wealth	less than 50.000 CHF	5.9%	9.1%
	between 50.000 and 500.000 CHF	64.7%	63.6%
	more than 500.000 CHF	11.8%	18.2%
	not specified	17.6%	9.1%
frequency of investment decision	every few years	11.8%	9.1%
	multiple times a year	82.4%	54.5%
	multiple times a month	5.9%	36.4%
	multiple times a week	0%	0%
decision making	solitary	82.4%	81.8%
	with partner	17.6%	18.2%

Table 6-11: Profile of sample of client survey on quality of advisory services

N = 136 respondents		*Count*	*N %*
age	*< 18*	*2*	*1.5%*
	18-24	*4*	*2.9%*
	25-34	*23*	*16.9%*
	35-44	*40*	*29.4%*
	45-54	*24*	*17.6%*
	55-64	*28*	*20.6%*
	65 or older	*15*	*11.0%*
gender	female	17	12.5%
	male	119	87.5%
education	compulsory education	0	0.0%
	apprenticeship	28	20.6%
	high school	14	10.3%
	university degree	90	66.2%
	not specified	4	2.9%
wealth	not specified	7	5.1%
	less than 50.000 CHF	39	28.7%
	between 50.000 and 500.000 CHF	76	55.9%
	more than 500.000 CHF	14	10.3%
working for FSP	yes	28	20.6%
	no	103	75.7%
	not specified	5	3.7%
investment experience	yes	125	91.9%
	no	8	5.9%
	not specified	3	2.2%

Table 6-12: Profile of sample client survey on information seeking behavior

N = 142 respondents		*% of all respondents*	*using bank advice (% of N per row)*	*using ind. FSP advice (% of N per row)*	*N per row*
age	< 18	2.1%	66.7%	66.7%	3
	18-24	2.8%	50.0%	.0%	4
	25-34	21.8%	80.6%	58.1%	31
	35-44	28.9%	85.4%	51.2%	41
	45-54	19.0%	70.4%	29.6%	27
	55-64	16.2%	87.0%	60.9%	23
	65 or older	9.2%	76.9%	46.2%	13
gender	female	12.7%	83.3%	61.1%	18
	male	87.3%	79.0%	46.8%	124
education	compulsory education	.0%	.0%	.0%	0
	apprenticeship	16.9%	79.2%	50.0%	24
	high school	7.7%	45.5%	18.2%	11
	university degree	72.5%	82.5%	49.5%	103
	not specified	2.8%	100.0%	100.0%	4
wealth	not specified	12.7%	83.3%	44.4%	18
	less than 50.000 CHF	7.0%	70.0%	50.0%	10
	between 50.000 and 500.000 CHF	63.4%	82.2%	48.9%	90
	more than 500.000 CHF	16.9%	70.8%	50.0%	24
frequency of investment decisions	less than twice a year	15.5%	81.8%	63.6%	22
	more than once a year	59.9%	85.9%	52.9%	85
	more than once a month	18.3%	69.2%	34.6%	26
	more than once a week	6.3%	44.4%	11.1%	9
decision making	solitary	62.0%	77.3%	46.6%	88
	with partner	38.0%	83.3%	51.9%	54
working for FSP	yes	24.6%	77.1%	31.4%	35
	no	71.8%	79.4%	53.9%	102
	not specified	3.5%	100.0%	60.0%	5

A2. Further Results

Table 6-13: Wilcoxon test results for frequency of usage and accessibility, *p*-values adjusted for multiple comparisons [Benjamini and Hochberg 1995]

	Information sources		*Z*	*p-value*	*r*
Frequency of usage	personal environment	professional Internet	-6.3327	0.000	-0.56
	personal environment	media	-5.0776	0.000	-0.44
	independent FSP advice	professional Internet	-6.0009	0.000	-0.74
	independent FSP advice	media	-5.5031	0.000	-0.66
	bank advice	professional Internet	-7.1146	0.000	-0.68
	bank advice	media	-6.8109	0.000	-0.64
	professional Internet	informal Internet	-7.1893	0.000	-0.70
	professional Internet	guidebooks	-7.1308	0.000	-0.69
	informal Internet	media	-5.4384	0.000	-0.52
	media	guidebooks	-6.7513	0.000	-0.65
	personal environment	independent FSP advice	-3.9536	0.000	-0.49
	independent FSP advice	informal Internet	-3.2634	0.002	-0.42
	independent FSP advice	guidebooks	-3.2604	0.002	-0.44
	independent FSP advice	bank advice	-3.2195	0.002	-0.39
	personal environment	bank advice	-3.1397	0.003	-0.30
	professional Internet	media	-3.0349	0.004	-0.26
Accessibility	personal environment	independent FSP advice	-8.4345	0.000	-0.74
	personal environment	guidebooks	-5.7272	0.000	-0.49
	independent FSP advice	bank advice	-6.7980	0.000	-0.60
	independent FSP advice	professional Internet	-8.9086	0.000	-0.79
	independent FSP advice	informal Internet	-7.1800	0.000	-0.65
	independent FSP advice	media	-8.4904	0.000	-0.76
	independent FSP advice	guidebooks	-6.0509	0.000	-0.54
	bank advice	professional Internet	-7.1298	0.000	-0.62
	bank advice	media	-6.8151	0.000	-0.59
	professional Internet	informal Internet	-6.4210	0.000	-0.57
	professional Internet	guidebooks	-7.9574	0.000	-0.69
	media	guidebooks	-7.7954	0.000	-0.68
	personal environment	bank advice	-5.0163	0.000	-0.43
	informal Internet	media	-4.7860	0.000	-0.42
	informal Internet	guidebooks	-3.9395	0.000	-0.35
	personal environment	professional Internet	-3.5569	0.001	-0.31
	bank advice	informal Internet	-2.7830	0.008	-0.25
	professional Internet	media	-2.3317	0.026	-0.20
	personal environment	informal Internet	-2.1798	0.038	-0.19
	personal environment	media	-2.0813	0.048	-0.18

Table 6-14: Wilcoxon test results for trust and comprehensibility, *p*-values adjusted for multiple comparisons [Benjamini and Hochberg 1995]

	Information sources		*Z*	*p-value*	*r*
Trust	independent FSP advice	professional Internet	-7.1928	0.000	-0.64
	independent FSP advice	media	-5.3801	0.000	-0.48
	bank advice	professional Internet	-7.3612	0.000	-0.63
	bank advice	media	-5.4628	0.000	-0.47
	professional Internet	informal Internet	-7.9458	0.000	-0.68
	informal Internet	media	-6.4128	0.000	-0.55
	professional Internet	guidebooks	-4.6657	0.000	-0.42
	personal environment	bank advice	-4.3988	0.000	-0.37
	personal environment	informal Internet	-4.1740	0.000	-0.36
	informal Internet	guidebooks	-4.0920	0.000	-0.37
	bank advice	guidebooks	-3.9515	0.000	-0.35
	personal environment	independent FSP advice	-3.7283	0.000	-0.33
	professional Internet	media	-3.6400	0.001	-0.31
	independent FSP advice	guidebooks	-3.5130	0.001	-0.32
	personal environment	professional Internet	-3.3410	0.001	-0.28
	media	guidebooks	-2.6560	0.011	-0.24
Comprehensibility	professional Internet	informal Internet	-5.2688	0.000	-0.47
	informal Internet	media	-5.3367	0.000	-0.47
	personal environment	informal Internet	-3.9471	0.000	-0.35
	independent FSP advice	professional Internet	-3.6974	0.000	-0.35
	personal environment	independent FSP advice	-3.5123	0.001	-0.33
	independent FSP advice	media	-3.5114	0.001	-0.33
	media	guidebooks	-3.5072	0.001	-0.32
	professional Internet	guidebooks	-2.8878	0.006	-0.26
	bank advice	media	-2.8793	0.006	-0.25
	bank advice	professional Internet	-2.6830	0.010	-0.23
	personal environment	bank advice	-2.6829	0.010	-0.23
	personal environment	guidebooks	-2.2603	0.031	-0.21

Table 6-15: Wilcoxon test results for effectivity and inefficiency, *p*-values adjusted for multiple comparisons [Benjamini and Hochberg 1995]

	Information sources		*Z*	*p-value*	*r*
Effectivity	independent FSP advice	professional Internet	-5.9420	0.000	-0.55
	bank advice	professional Internet	-5.8728	0.000	-0.51
	professional Internet	informal Internet	-7.8796	0.000	-0.68
	informal Internet	media	-6.4262	0.000	-0.56
	professional Internet	guidebooks	-4.6114	0.000	-0.42
	personal environment	professional Internet	-4.2417	0.000	-0.36
	independent FSP advice	media	-4.0104	0.000	-0.37
	informal Internet	guidebooks	-3.9558	0.000	-0.36
	bank advice	media	-3.7562	0.000	-0.32
	professional Internet	media	-3.1351	0.003	-0.26
	personal environment	informal Internet	-2.7920	0.008	-0.24
	independent FSP advice	guidebooks	-2.7053	0.010	-0.26
	media	guidebooks	-2.6823	0.010	-0.24
	bank advice	guidebooks	-2.5737	0.014	-0.23
	personal environment	media	-2.4176	0.021	-0.21
Inefficiency	personal environment	independent FSP advice	-8.8048	0.000	-0.79
	personal environment	bank advice	-8.8489	0.000	-0.79
	personal environment	informal Internet	-5.2904	0.000	-0.48
	personal environment	guidebooks	-7.6858	0.000	-0.69
	independent FSP advice	professional Internet	-7.1602	0.000	-0.64
	independent FSP advice	informal Internet	-5.5924	0.000	-0.52
	independent FSP advice	media	-7.0283	0.000	-0.62
	bank advice	professional Internet	-6.4535	0.000	-0.55
	bank advice	media	-6.3684	0.000	-0.54
	media	guidebooks	-5.5016	0.000	-0.49
	professional Internet	guidebooks	-5.0229	0.000	-0.45
	personal environment	media	-4.6442	0.000	-0.40
	bank advice	informal Internet	-4.4836	0.000	-0.41
	personal environment	professional Internet	-3.6090	0.001	-0.31
	professional Internet	informal Internet	-3.4271	0.001	-0.31
	independent FSP advice	guidebooks	-3.1367	0.003	-0.29
	informal Internet	guidebooks	-3.1308	0.003	-0.29
	independent FSP advice	bank advice	-2.7728	0.008	-0.25
	informal Internet	media	-2.6639	0.011	-0.24

7 Essay II: Designing for Transparency in Client-Advisor Encounters – The Case of Investment Advice

Abstract

This essay argues that shared collaborative IT artifacts are a feasible and useful means to improve transparency of asymmetric client-advisor encounters and to increase client satisfaction. We suggest that information, knowledge and interest asymmetries in client-advisor encounters can be addressed by increasing transparency with shared IT artifacts, concerning (1) the disclosure of what activities are performed and why (process transparency) and (2) the revelation of the advisor's information base as well as showing what information is used for what purpose and with what effect (information transparency). Based on three consecutive build-and-evaluate iterations in the domain of financial investment advice, we will devise an initial design theory of implementing shared IT artifacts supporting such notions of transparency in asymmetric client-advisor encounters.

While the individual iterations informed our understanding of the underlying transparency mechanisms of client-advisor interaction, the concatenation of their findings proved to be the *sine qua non* to specify the final successful design and to devise design principles of transparency. Exploratory evaluations of the built shared IT artifacts for investment advisory encounters suggest the usefulness of the design principles to increase process and information transparency; furthermore, our results provide insights of how such increased transparency relates to other determinants of the service encounter as perceived by the client, including controllability of the situation and overall satisfaction.

7.1 Introduction

Many important decisions are not made by the decision-maker alone but often after consulting with others [Bonaccio and Dalal 2006:128], seeking to make better decisions and avoid mistakes [Heath and Gonzalez 1995]. This demand is increasingly accommodated by advisory services also in sales-oriented domains, where individuals are offered decision support or advice regarding, e.g., their next vacation (travel consultancy), securing their life and property (insurance advice) or their financial investments (investment advice) [Schmidt-Rauch and Nussbaumer 2011]. Such services, however, are

strained by several asymmetries regarding information, knowledge and interests of the lay client and the expert advisor, and therefore further agency conflicts [Eisenhardt 1989; Mishra 2004].

In this essay, we argue that these asymmetries and conflicts are detrimental to advisory quality and client satisfaction. Indeed, in different domains, quality and client satisfaction of advisory services is deemed rather low (e.g., travel counseling [Novak and Schwabe 2009; Novak 2009] or investment advice [Jungermann and Belting 2004; Mogicato et al. 2009; Oehler and Kohlert 2009]). We find one prime cause in the services' basic rationale of combining advice with product sales (e.g., travel bookings, investment products). Information and knowledge asymmetries [Sharma 1997] may favor advisor opportunism – advisors, for example, may take advantage of the client's informational deficiencies by optimizing advice and recommendations to their self-interest and either over-provide their services (e.g., provide products the client does not need) or under-provide them (e.g., limiting their effort of finding appropriate products) [Mills 1990; Mishra 2004]. Being a layperson regarding the domain information and advisory processes, the client may not be able to uncover such over- and under-provision and correctly evaluate the quality of the recommendation [Jungermann 1999; Oehler and Kohlert 2009]. Lack of means to control for advisor opportunism and verify the provided recommendation may affect advisor-client interaction and further low satisfaction [Inbar and Tractinsky 2011].

Against this background, in this essay we suggest that the problems of client-advisor asymmetries and related low client satisfaction may be addressed by increasing *transparency* of the advisory encounter. We argue that shared collaborative IT artifacts are a feasible and useful means to improve such transparency in client-advisor interaction, such that shared informational resources increase the client's comprehension of the advisor's information (information transparency) and his actions (process transparency). We will investigate the feasibility and usefulness of this solution approach in the domain of financial investment advisory services, building and evaluating shared artifacts in three design science research iterations. Based on our observations and findings from these iterations, the essay will devise an initial design theory of how to improve transparency for client-advisor encounters in general.

The research reported in this essay is based on findings of a research project at University of Zurich in cooperation with UBS and Zurich University of the Arts, which was co-financed by the Swiss commission for technology

and innovation. The project's concepts and findings were previously published in Nussbaumer et al. [2010; 2011; 2012b; 2012c] as well as Schmidt-Rauch and Nussbaumer [2011].[22]

This essay is organized as follows. Section 7.1.1 and Section 7.1.2 of the introduction will summarize the research problem and provide details on our research approach. The remaining sections of the essay follow the structure of our research process, which was based on Peffers' et al. [2007] design science research methodology. Section 7.2 is dedicated to the identification of problems in client-advisory encounters; to address these problems, Section 7.3 motivates the general solution approach of transparency. In Section 7.4, we introduce investment advisory services as an exemplary domain of asymmetric client-encounters, which we will then use to investigate the feasibility and utility of shared IT artifacts to enable transparency. Sections 7.5 to 7.7 present three build-and-evaluate iterations of such IT artifacts for investment advisory encounters, each providing details on the solution objectives, design and development and evaluation. From our findings and experiences in these design research iterations, we will devise an initial design theory of transparency in Section 7.8. We will conclude our design science endeavor in Section 7.9.

7.1.1 Research Problem

We argue that some general issues of advisory encounters are inherently related to information, knowledge and interest asymmetries between the client and the advisor. In this essay, we suggest that these asymmetries may be effectively addressed by introducing different facets of *transparency* to increase the client's comprehensibility of the advisory encounter. Making transparent the advisor's actions and their rationale (process transparency) as well as the underlying information (information transparency) should improve the client's ability of assessing and validating the advisory course, its underlying information and its results. Also, increasing the client's comprehensibility should enable her to better contribute to the process and allow for actual co-creation of its results. While increased comprehensibility of their advisor's recommendation in respect of important decisions hence is an end in itself, transparency may also be a means to address correlates of the current asymmetries, e.g., low perceived advisory quality and client satisfaction [Inbar and Tractinsky 2011; Oehler and Kohlert 2009].

[22] According references to these publications are provided throughout this essay.

In our research, we address the question of how such transparency may be enabled with the introduction of collaborative IT artifacts. Therefore, this essay has two main aims; (1) we will show how we built and evaluated shared IT artifacts in the domain of financial investment advice along three concatenated design science research cycles [Peffers et al. 2007]; (2) from our findings, we will derive general design principles and put forward an initial design theory of improving transparency in client-advisor encounters.

Solutions to agency problems in such service contexts have been predominantly sought in two areas; (1) pre-contract strategies (e.g., signaling, screening [Bergen et al. 1992; Mishra 2004]), which only provide conditions to cope with ambiguity rather than to actually reduce asymmetries [Singh and Sirdeshmukh 2000:153]; (2) top-down laws and regulations in respect of increased execution transparency and consumer protection (e.g., MiFID for European financial markets [European Commission 2004]), which are found to fail because of their lack of comprehensiveness and specificity [Oehler and Kohlert 2009].

This essay introduces a novel approach of actually addressing prevalent asymmetries in client-advisor encounters. Our research contextualizes findings of diverse fields that traditionally have been investigated in isolation; we combine research on judge-advisor systems and advice-giving and taking [Bonaccio and Dalal 2006; Jungermann 1999] as well as agency research and agency relationships in service encounters [Bergen et al. 1992; Eisenhardt 1989; Mishra 2004; Singh and Sirdeshmukh 2000] with diverse literature on transparency [e.g., Andersson and Holm 1998; Carter and Curry 2010; Eggert and Helm 2003].

Against this background, we propose a first account on the role of different facets of transparency for client-advisor encounters as well as their support with shared IT artifacts. Introduction of supportive IT artifacts into such encounters constitutes a rather novel approach, with little research providing insights into their requirements, implementation and effects [e.g., Halloran 2002; Novak and Schwabe 2009; Schmidt-Rauch and Schwabe 2011]. As such, the essay takes a perspective that focuses on asymmetry and transparency issues in client-advisor interaction and their potential solution with shared IT artifacts; it explicitly excludes other relevant aspects of advisory encounters, e.g., user experience [Novak and Schmidt 2009], advisor training [Schmidt-Rauch and Geiger 2010] or financial literacy [Mitchell and Lusardi 2011].

7.1.2 Research Approach

In our research, we aim to improve transparency of asymmetric advisory encounters with a shared IT artifact that mediates client-advisor interaction. Exemplarily investigating the domain of investment advisory services, we suggest that such artifacts contribute to solve the business problems of perceived low advisory quality and low client satisfaction.

In seeking to develop a technological solution for a practical problem, our research qualifies as a design science research endeavor [Hevner et al. 2004]. The two main processes of design science research are to *build* artifacts (constructs, models, methods, or instantiations) to demonstrate their feasibility in addressing practical problems, and *evaluate* them to determine their utility in solving these problems [March and Smith 1995].

An important issue of such design science research is to capture and communicate the design knowledge incorporated into the artifact. Gregor and Jones [2007] suggest codifying such knowledge into *design theories*. Rather than only explaining *why* an artifact's design solves the problem, such theories focus on giving explicit prescriptions on *how* to design and develop a solution artifact [Gregor and Jones 2007:313]. Such prescriptions or technological rules may take the form of heuristics: "if you want to achieve Y in situation Z, then something like action X will help" [van Aken 2004:227].

To guide our research process, we followed the Design Science Research Methodology (DSRM) suggested by Peffers et al. [2007], which segments the proceedings of design research into six consecutive activities. Along these activities, in this essay we report three build-and-evaluate design science iterations; these iterations aim to demonstrate the feasibility and utility of shared IT artifacts to address transparency issues in investment advisory service encounters. From our experiences and observations in implementing and evaluating these artifacts for investment advice, we will infer an initial design theory of transparent artifacts for general asymmetric client-advisor encounters. Representing the important principles of our solution as a design theory should make them applicable to similar systems yet to be constructed, also in other domains.

According to Gregor and Jones [2007], a design theory consists of eight components (Table 7-1). Given the practical stance of design science research, the components of a theory may be "extracted from observation and inference from already instantiated artifacts" [Gregor and Jones 2007:321]. In doing so, some components of a design theory may be specified in earlier phases of a design science research endeavor (e.g.,

purpose and scope), others seem to require at least one build-and-evaluate iteration to be conducted (e.g., principles of implementation and expository instantiation of the design theory). However, the definition of each component of a design theory is correlated to particular activities of the DSRM process of Peffers et al. [2007]. Thus, in describing our research along the DSRM process below, we will also point to the relevant design theory components as parts and potential outputs of the single activities. We will start our considerations with a brief overview and will provide details on the activities thereafter.
Figure 7-1 provides an overview of the mentioned activities' most important concepts and outputs and contextualizes them along the research process of problem exploration and solution exploration (i.e., design and evaluation).

Table 7-1: Components of an Information Systems Design Theory [Gregor and Jones 2007]

Component	*Description*
1) Purpose and Scope	Set of goals that specifies the type of artifact to which the theory applies (scope, boundaries)
2) Constructs	Entities of interest in the theory
3) Principle of form and function	Principles that define the structure, organization, and functioning of the design artifact
4) Artifact mutability	Changes in the artifact anticipated by the theory (evolution or adaptation)
5) Testable propositions	Propositions or hypotheses about the constructed artifact against which it can be tested
6) Justificatory knowledge	Knowledge that gives base or explanation for the artifact design
7) Principles of Implementation	Process of implementing the theory (artifact) in specific contexts
8) Expository instantiation	Physical implementation of the artifact for the purpose of theory representation or testing

As suggested by the DSRM, we dedicated the first activity of our research process to problem exploration, i.e., to (1) identify an *organizational problem*, atomize the problem into its underlying *causes* and show the importance of a solution. Based on the problem definitions, we initiated several iteration loops of a solution-finding process, where each loop (2) defined the respective *solution's objectives*, (3) designed and built the artifact according to *design requirements* of what the artifact has to afford to accomplish the solution objectives, and (4) demonstrated how the *artifact* may be used to solve the problems. Finally, for each loop we conducted (5) evaluations using experimental techniques to investigate the artifact's utility

against the solution objectives. If the artifact had failed to fulfill the objectives, a consecutive iteration was initiated. This essay's goal is to report on three such iterations and devise an initial design theory of how to introduce transparency into client-advisor encounters, thus (6) communicating the research results.

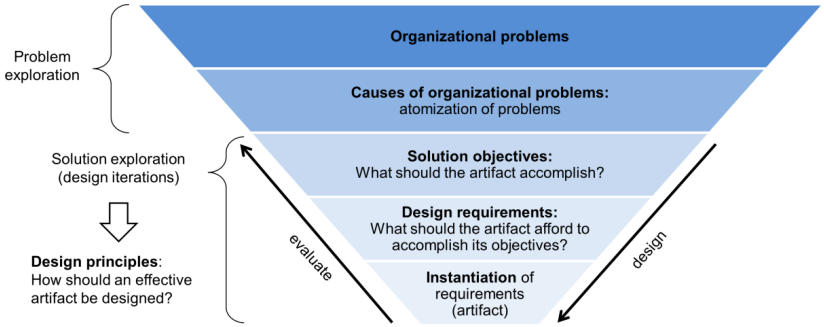


Figure 7-1: Meta concepts of the design research process

(1) Identify Problem and Motivate. As design science "creates and evaluates IT artifacts intended to solve identified organizational problems" [Hevner et al. 2004:77], the first activity of the design science research process is to specify the research problem and justify the value of a solution [Peffers et al. 2007:52].

In this essay, we address the organizational problems arising from inherent issues in advisory service provision (see Section 7.2). We show how these issues occur in financial investment advisory services (Section 7.3), leading to low advisory quality and, thus, low client satisfaction.

Because the problem definition provides the basis of developing a solution artifact, Peffers et al. [2007] suggest that "it may be useful to atomize the problem conceptually so that the solution can capture its complexity" (p. 52). We atomize our organizational problem into four inherent causes of client dissatisfaction in asymmetric advisory services, which guide the further build-and-evaluate activities: the problems of concealment, diverging goals, undissolved complexity, and low controllability (see Section 7.2).

In respect of the design theory, the activity of problem identification and motivation provides a first basis of its *purpose and scope*, i.e., for which contexts the theory may be applicable and in which contexts the respective artifacts are intended to operate. While we conduct our build-and-evaluate iterations in the domain of investment advisory services, we aim to broaden

the purpose and scope of our initial design theory to include general asymmetric client-advisor encounters.

(2) Define Objectives of the Solution. The goal of this activity is to infer the *solution objectives* from the preceding activity's problem definition as well as knowledge of "what is possible and feasible" [Peffers et al. 2007:55], i.e., the state of problems and current solutions. Objectives answer the question of how an artifact is expected to support a solution to the identified problems.

Based on existing CSCW and HCI research, we find that collaborative IT artifacts may constitute an appropriate solution approach; we suggest that a shared transparent IT artifact contributes to address existing problems of advisory service provision, and to address the organizational problem of low advisory quality and client satisfaction.

To provide a solution to the identified problems, with such IT artifacts we aim to accomplish four objectives; (1) increase the service encounter's process transparency (comprehensibility of the advisor's actions) as well as (2) increase information transparency (comprehensibility of advisory information), while also enabling (3) increased client controllability of the service encounter. Attaining these solution objectives should give way to (4) increased overall client satisfaction.

The concepts of transparency and controllability (and, overall, client satisfaction) are related to the *constructs* required by a design theory, i.e., the representations of the entities of interest in the theory (Section 7.3). In design theories for information technologies, single constructs may represent semi-independent sub-systems or components, for which the designs may be carried out with some degree of independence [Gregor and Jones 2007:325]. In respect of their possible design, process and information transparency are such semi-independent components in that they address different solution objectives. As we assume increased controllability to be partly a consequence of increased transparency, however, designing for controllability shows some dependencies to the chosen transparency designs. Within these limits, we also address controllability as a single component and, consequently, as a separate solution objective. In our research, we assume that client satisfaction depends on the degree of transparency and controllability perceived by the client, making increased client satisfaction a direct consequence of successful transparency and controllability design. As such, we seek to attain our objective of increased satisfaction based on the fulfillment of the other solution objectives.

(3) Design and Develop. Design research must produce an "artifact created to address a problem" [Hevner et al. 2004:82], which should be relevant to the solution of a "heretofore unsolved and important business problem" [Hevner et al. 2004:84]. The design-and-develop activity includes determining the artifact's required functionality to accomplish the solution objectives; upon these *design requirements* the actual artifact is then created, e.g., implemented in a software prototype.

While the design and develop activities for our first iteration were based on inputs from expert interviews and focus groups, we contextualized the second iteration of our research process with methods of scenario-based development [Rosson and Carroll 2002] to enable artifact designs and instantiations that better conform to the actual users' needs and preferences. This approach is based on close collaboration with actual users and dedicated to acknowledge their understanding of problems, requirements and possible solutions. In an iterative manner, scenario-based development starts with the creation of problem scenarios in the form of short stories that mirror the researchers' understanding of the situation and may be easily understood and validated by users. In a similar manner, the users' feedback may be gained for solution objectives (activity scenarios, i.e., stories about using the new artifact), and, as a next step, paper-based low-fidelity prototypes, presenting different aspects of the artifact. Prior to implementing high-fidelity, functional prototypes, such an approach allows to iteratively and rapidly improve the artifact's design. To implement this process for our second and third iteration, six key users (three advisors and three clients) were involved in iterative problem specification and solution validation.

Many of the components required by a design theory are informed by design and develop activities. First, they may specify *principles of form and function,* which define the "structure, organization, and functioning of the design product" [Gregor and Jones 2007:325]. While design requirements define *what* functionality the artifact has to afford, such principles correspond to *how* the requirements may be instantiated to accomplish the solution objectives. Our instantiations of the design requirements, which evolved along the design iterations, provided the basis for the design theory's final design principles. Second, in our research we implement the solution artifacts as software prototypes. These prototypes relate to *expository instantiations* required by a design theory, contributing to the "identification of potential problems in a theorized design and in demonstrating that the design is worth considering" [Gregor and Jones 2007:329]. Third, describing the development process may also inform the

design theory's *principles of implementation,* i.e., how the designs are brought into being.
Fourth, the *justificatory knowledge* of the design theory, i.e., the knowledge that gives a basis and explanation for the design, plays a pivotal role in designing and developing artifacts. The knowledge base is used to find and choose amongst design alternatives or alternative ways of instantiating them. We base our considerations on several bodies of knowledge (see Section 7.2 and Section 7.3), including agency research, judge-advisor systems and advice-giving and taking, as well as literature on transparency and collaborative IT support. Our artifact designs and their instantiations evolved along the research process, where each iteration was built on the experiences of the previous one. With the designs, their justificatory knowledge evolved as well, providing a rich background for the resulting design theory.
Finally, the choices among design alternatives and instantiations may also inform *artifact mutability* of a design theory, pointing to potential changes and improvements to evolve or adapt the artifact, e.g., for other application domains.

(4) Demonstrate and (5) Evaluate. The use of the designed artifact has to be demonstrated for at least one instance of the problem, involving "its use in experimentation, case study, proof, or other appropriate activity" [Peffers et al. 2007:55]. Thus, the artifact's use may be demonstrated while evaluating its *utility*. Such evaluation has the goal of observing and measuring whether the artifacts succeeds in fulfilling the solution objectives defined in Activity 2. If the artifact supports a solution to the defined problems, research may proceed with communicating the results (Activity 6); if not, consecutive design iterations may be initiated in Activity 3, trying to improve the effectiveness of the artifact.
In the literature, several methods have been proposed for the evaluation of design science research artifacts, including observational studies, action research, surveys, analytical analyses, functional or structural test, descriptive argumentation and controlled experiments or simulations [see overviews, e.g., in Cleven et al. 2009:4; Hevner et al. 2004:18]. Experimental techniques are widely used in human-computer interaction research, particularly to evaluate design solutions [Lazar et al. 2010:42]. As such, they are deemed very effective to determine causality while controlling for extraneous variables [Siau and Rossi 2011:258].
In our research, we conducted exploratory evaluations using such experimental techniques to evaluate our designed artifacts and measure their influence and effects on client-advisor encounters. We assigned test subjects

(here: clients and advisors) to treatment and control conditions, manipulated the independent variable (here: artifact support, such that the treatment condition involves the using the artifact, whereas the control condition refers to the unsupported, traditional encounter) and measured the effects on the dependent variables (e.g., process transparency) [Siau and Rossi 2011:257]. The evaluations followed a within-subject design, where each client participant was exposed to both the treatment and the control condition and was then asked to evaluate the differences along several metrics. We used metrics of process transparency, information transparency, controllability and satisfaction to operationalize our main hypotheses regarding the artifacts' utility and to assess whether the artifacts accomplished their solution objectives.

The predictions or hypotheses about the outcomes of the artifact that are tested in evaluations relate to the design theory's *testable propositions*. In a general form these propositions may read as: "If a system or method that follows certain principles is instantiated then it will work, or it will be better in some way than other systems or methods" [Gregor and Jones 2007:327]. Such propositions may vary in their degree of generality, from general claims that a design works universally in many context to propositions that are only approximations of what will work in different contexts [Gregor and Jones 2007:327].

(6) Communication. The resulting knowledge of the conducted research needs to be communicated, including "the problem and its importance, the artifact, its utility and novelty, the rigor of its design, and its effectiveness" [Peffers et al. 2007:56]. We meet this requirement in the current essay.

As indicated above, iterating the build-and-evaluate activities of the DSRM process allowed building subsequent solution designs on the experiences and findings of the respective previous iterations. This concatenation of our research allowed us to iteratively progress towards successful transparency designs, which we will devise as an initial design theory in this essay. We will briefly summarize the three iterations below.

First iteration: Our first iteration started with a identifying and motivating our research endeavor. Having identified investment advisory services as a prime example of asymmetric client-advisor encounters, the problem identification phase included an in-depth study of such advisory services in Swiss FSPs [Mogicato et al. 2009; Nussbaumer et al. 2011]. Surveying different stakeholders (clients, advisors, and managers) allowed us to define an initial set of problems to address and also informed the design of our first

design solution. We implemented the design solution in a software prototype for a multi-touch tabletop system (Microsoft Surface) and evaluated its utility.

Second iteration: Evaluation of the first software prototype showed that the solution objectives of transparency could not be attained. Thus, we initiated a second process iteration, where we revised the design requirements and re-implemented their instantiation in a new software prototype. For the design to better conform to the actual users' needs and preferences, we contextualized the second iteration of our research process with methods of scenario-based development [Rosson and Carroll 2002]. Again, we implemented the software prototype for the multi-touch tabletop system and conducted evaluations.

Third iteration: Since the results of our second evaluation were promising but constrained by obvious interaction design issues, we entered a third build-and-evaluate iteration. We again followed the scenario-based development process to design and develop the solution artifact. We built on our initial problem statements and solution objectives but revised our design requirements and their implementation in the tabletop software artifact. Our evaluation showed that this final artifact could successfully accomplish all solution objectives.

7.2 Problem Identification

Counseling and advice provide decision guidance for particular problems (e.g., career, marriage, substance abuse) [Warschburger 2009:4]. In such psychosocial contexts, counseling aims to broker relevant information and build or practice the client's capabilities in order to enable her in helping herself [Warschburger 2009:25; Brown et al. 2006:7]. Disregarding such origins, the notion of professional counseling and advice has also been used exceedingly in service provision, e.g., management consultancy, travel counseling or financial investment advice [Schmidt-Rauch and Nussbaumer 2011]. While in such service settings the client also seeks to be enabled and empowered to solve a problem (e.g., make-or-buy decisions, planning a holiday trip, investing in mutual funds) and implement an appropriate solution, their basic character is sales-oriented – there is no explicit intention to develop *expertise* in the advised person. Thus, should a similar problem arise in the future, the client may have to return to the source of advice [Brown et al. 2006:8].

This orientation towards sales rather than counseling may lead to potential issues regarding the provider's self-interest, such as to provide recommendations that are optimized towards his own revenues rather than the client's needs. As encounters between advisors and clients are also characterized by information and knowledge asymmetry, such advisor opportunism may be additionally aided.

In the literature, such facets of advice and advisory encounters have been discussed from different perspectives, but seldom in an integrative manner. For the purpose of this essay, we will summarize literature of the relevant areas of judge-advisor systems and advice-giving and taking [Bonaccio and Dalal 2006; Sniezek and Buckley 1995] and integrate it with relevant concepts from agency research [Sharma 1997; Singh and Sirdeshmukh 2000; Eisenhardt 1989]. In a novel effort, we will then contextualize the findings of these bodies of knowledge with literature on transparency, providing a new perspective on potential solutions to agency problems in advisory encounters.

7.2.1 Advisory Encounters and Decision Making

Individuals may seek advice for different problems and reasons; they may seek decision guidance from psychological counselors (e.g., requesting advice on career, marriage, substance abuse) [Warschburger 2009], medical advisors (e.g., seeking advice on medical treatments) [Jungermann 1999] or, with the constant growth of service industry, increasingly "practical" advisors (e.g., insurance advice, investment advice, travel counseling).

Advisors, however, may fulfill different functions. In psychological counseling, for example, the advisor's role lies in practicing the client's capabilities in order to enable her in helping herself [Schwarzer and Posse 1986; Warschburger 2009:25]; in medical advice, advisors may be consulted because of their expertise in providing relevant information that the clients may not gather or process; yet another function lies in information brokering [Valley et al. 1992], where advisors collect and sell information to clients that are not willing to invest time and effort themselves, such as in travel consulting [Jonas and Frey 2003:154]. Other advisors may as well fulfill both of the latter functions, i.e., providing expert domain knowledge and brokering relevant information, e.g., in insurance or investment advice, where the client either lacks knowledge to gather all relevant information or lacks access to important information.

For quite some time, research on judge-advisor systems has investigated advice utilization and judgment accuracy in respect of different

characteristics of both the advisor and the decision maker [Bonaccio and Dalal 2006; Harvey and Fischer 1997; Sniezek and Buckley 1995; Yaniv 2004]. Especially for complex problems, individuals use input from others to make better decisions (and with greater accuracy) and avoid mistakes, to be provided with new information and perspectives, to gain more confidence for their decision at hand [Heath and Gonzalez 1995] and to share responsibility of the decision outcome [Harvey and Fischer 1997]. Indeed, using advice has been found to increase decision accuracy [Bonaccio and Dalal 2006:133] and advisors have been found to engage in a less biased and more balanced information search and to exhibit greater concern regarding the accuracy of their recommendation [Jonas and Frey 2003], thus employing more task-related effort [Kray 2000].

However, most research on judge-advisor systems neglects two features of dyadic consulting interaction; firstly, experimental setups mostly allow no direct interaction between advisor and client [Bonaccio and Dalal 2006:138]. Secondly, they do not acknowledge that in such dyadic decision situations expertise and experience are asymmetrically distributed between advisor and client.

Jungermann and Fischer [2005] ascribe this *informational asymmetry* to differences in knowledge and solution-finding strategies between clients and advisors. Advisors are more experienced with client problems and their potential solutions, have extensive knowledge regarding the relevant facts and "statistical knowledge" (or technical database) of client goals and values, their coping behaviors, biases, etc. Furthermore, the advisor has explicit procedural knowledge of how to arrive at a solution [Jungermann and Fischer 2005:158–159]. Clients, on the other hand, are usually laypersons lacking the relevant factual knowledge and systematic solution-finding strategies, and even might have only limited awareness of their own goals, values and preferences; finally, clients are not familiar with the advisors' decision making and thus will have difficulties in understanding the recommendation, its rationale and possible alternatives [Jungermann and Fischer 2005:159–160].

There are some consequences of these asymmetries; without the client being able to notice, advisors may categorize clients and their problems and select the best option associated with the category rather than evaluating the complete set of options [Jungermann and Fischer 2005:160; Jungermann 1999:5]. They will provide only the output of their solution search, explaining and justifying their recommendation, but will provide no reasoning how they arrived at the solution [Jungermann 1999:6].

Nevertheless, the relationship between advisors and customers is still functional because they are accustomed to acting "as if". While advisors act as if they had gathered and provided all relevant information and as if the client understood them, the latter will behave analogously, acting as if they understood the provided information and solutions [Jungermann and Belting 2004].

This equilibrium shows some severe drawbacks – not only does under this assumption the client not sufficiently understand the procured information and solution; the client will also be vulnerable to potential self-interests of the advisor. While the discussed research on judge-advisor systems and advice giving and taking indeed finds information asymmetry an inherent characteristic of advisor-client encounters, one immediate consequence has found less consideration, i.e., the potential moral hazard of the advisor to take advantage on the less knowledgeable client. Such issues have been investigated by agency research, which will be discussed in the following section.

7.2.2 Agency Characteristics of Advisory Encounters

As implied above, advisor-client interactions feature characteristics of principal-agent relationships, which have been prominently investigated by agency research [Eisenhardt 1989; Mishra 2004; Singh and Sirdeshmukh 2000]. Traditionally, agency theory is concerned with "relationships that mirror the basic agency structure of a principal and an agent who are engaged in cooperative behavior, but have differing goals and differing attitudes to risk" [Eisenhardt 1989:59].

Such relationships are characterized by one party (the agent, i.e., the advisor) undertaking actions on behalf of another (the principal, i.e., the client). In general, agency theory investigates such relationships in terms of *information* and *interest asymmetries*.

Information asymmetry relates to agents being more knowledgeable about their own actions than the principal, making it difficult or expensive for the principal to verify what the agent is actually doing and evaluate the quality of his actions. Interest asymmetry (and its potential consequence of opportunism) is based on the assumption that partners in exchange are motivated by self-interest and are likely to exploit information asymmetry to further their self-interest. Such interest asymmetries may be ameliorated by adequate compensation systems which do not only focus on output quantity but also its quality [Mishra 2004].

If principals seek out agents for their specialized knowledge, as it may be the case for advisory encounters, client and advisor partake in a principal-professional relationship [Shapiro 2005:276; Sharma 1997]. In such situations, the principal may not only lack information of *what* the advisor does (information asymmetry), but also *how* he is doing it, introducing the problem of *knowledge asymmetry*. Thus, the lay principal may not possess the knowledge to evaluate or verify the professional's effort or outcome.

Much research has investigated specific principal-agent relationships [Golec 1992:81], e.g., those of shareholder-manager [Jensen and Meckling 1976], issuer-investment banker [Baron 1982], or intra-organizational relationships of employer-employee (see, for example, overviews in Eisenhardt [1989:66–67] and Bergen [1992:10–11]). Also, the relationship between employees of service organizations and their customers has been considered, e.g., regarding prescriptive governance mechanisms to improve effectiveness of service firms (cf. Sharma [1997:759]).

In the following, we will integrate important characteristics of advisory encounters from an advice giving and taking perspective with issues caused by the inherent principal-agent relationship of advisor and client. Advisory encounters (e.g., travel counseling, insurance and investment advisory services) share the following characteristics (adapted and extended from Schmidt-Rauch and Nussbaumer [2011:4]).

Encounter of experts and laypersons. At the intersection of advice giving and taking research and agency research, advisory services can be conceptualized as encounters of experts and laypersons partaking in principal-professional relationships [Sharma 1997], where the principal is requesting help from the professional within a specific problem domain.

While clients may know that there are high and low quality providers, the distinguishing characteristics are not transparent to them (hidden characteristics) [Singh and Sirdeshmukh 2000:141]. Furthermore, the advisor is typically more knowledgeable about his own actions than the client, i.e., the client may observe and evaluate the advisor's output but does not know *what* the advisor is doing and may therefore not observe the quality of the output (hidden action, e.g., Bergen et al. [1992:3ff]). Even if the client is able to observe the advisor's actions, the latter has power over the lay client by virtue of his expertise – the client may neither possess the factual nor procedural knowledge to evaluate the advisor's effort or accomplished outcome, i.e., the client cannot understand *how* the agent arrives at a specific recommendation (hidden information, e.g., Bergen et al. [1992:6ff]).

The expert-layperson asymmetry also impacts the comprehensibility of the encounter as perceived by the client. The client's information processing capabilities are limited (bounded rationality, Simon [1991]); thus it may be unrealistic that disclosure of all relevant factual and procedural information could actually be processed by clients [Jungermann 1999:9] due to potential information overload [Eppler and Mengis 2004; Maes 1994], especially for complex decisions like they occur in investment advisory [Harrison 2002:8f; Oehler and Kohlert 2009:102]. Not only do bounded rationality and information overload lead to decision heuristics and systematic failures in client judgment [Stracca 2004] but also do they make the client especially vulnerable towards advisors taking advantage on the information and knowledge asymmetries.

Diverging goals and opportunism. As discussed above, information and knowledge asymmetries between advisors and clients are problematic because they impair the client's understanding of the advisory encounter (i.e., the underlying information and advisor actions) and may thus affect her decision making. These problems are aggravated in situations where advisor and client have diverging goals and, thus, conflicts of interest appear (interest asymmetry). Such conflicts arise in most advisory service encounters, since advisors take on the agent's role in two principal-agent relationships [Mishra 2004]: an investment advisor is the agent of a client principal, for whom he undertakes actions, e.g., to find an optimal investment portfolio for his client. At the same time, he is agent of a profit-seeking firm that demands selling particular products. Therefore, the advisor may engage in hidden action and hidden information both towards the client principal and the corporate principal: Will he sell particular products even if they are not suitable for the clients to follow the goals of the firm principal? Or will he under-provide (e.g., by only superficially preparing recommendations to increase efficiency) or over-provide the client (e.g., to sell more expensive products because of provisions and commissions) to follow his own personal goals?

Advisory services often propagate compensation schemes that further deteriorate such agency problems; in the prevailing business model of investment advisory services, for example, service of advice is offered free of charge but cross-subsidized by provisions and fees of product sales, pressuring advisors to efficiently sell their products or incentivizing them to increase their earnings by selling specific products [Financial Services Authority 2009; Inderst and Ottaviani 2011; Mullainathan et al. 2011; Oehler and Kohlert 2009].

Such conflicts are not exclusive to sales-oriented advisory encounters and their compensation schemes; they may also appear in situations where no specific products or services are exchanged. Physicians as medical advisors, for example, may have incentives to recommend particular treatments to promote their own research. Patients, however, are unable to determine the treatments' appropriateness [Mills 1990:35]. Thus, at presence of conflicts of interests and given the information and knowledge deficiencies of the client, the advisor may act opportunistically in self-interest and organizational interest with little risk of being caught [Jungermann 1999:8; Oehler and Kohlert 2009:94f; Shapiro 2005:267].

Co-created solutions. Typically, the goal of an advisory encounter is the advisor providing the client with a problem-specific and individual recommendation (solution). In most advisory domains, the recommendation is thus highly dependent from the client's specific situation, needs and goals. Therefore, prior to the actual encounter, the solution and/or its specific configuration is unknown to both the advisor and client – in fact, the solution is jointly co-created on the basis of their interaction [Prahalad and Ramaswamy 2004; Vargo and Lusch 2004]. Such co-creation requires inputs from either party; while the advisor relies on the client for input information on her specific situation and needs (problem space), the client relies on the advisor's explanations and recommendations (solution space).
The client-advisor dialogue enabling co-creation, however, is hampered by information and knowledge asymmetries. These asymmetries complicate the client's comprehension of her own role and tasks as well as the advisor's actions and recommendations. Thus, the client may be hindered to contribute. In fact, she may not even have enough control of the process and its results to and take the role of the primary decision maker; as the advisor is providing the majority of inputs and recommendations, he might represent the real locus of decision [Jungermann 1999:4].

Complex problem-solving process. Even though an individualized solution for the client should be inherently co-created by both actors, information and knowledge asymmetry hinder effective collaboration. The general, idealized process of problem solving involves potentially complex mappings of the client's problem space (needs, situation, and preferences) to the advisor's solution space (options, configurations). In practice these idealized process is hampered by several asymmetries. While information regarding the solution space of the advisor may be concealed from the client, also the elicitation of the client's problem space may prove difficult: typically, clients lack

knowledge of and experience with the advisory situation and may not have thought about their particular goals and needs in advance [Dorn-Seifert 2004] or may not be aware of them because of their early state in the problem-solving process [Belkin 2005; Kuhlthau 1999]. Thus, problems and needs may be fuzzy and "sticky" [von Hippel 1994].

Likewise, client preferences may be unstable and stochastic [Kahneman 1994] and may be developed not until the process of elicitation [Hibbard et al. 1997; Slovic 1995]. Hence, preferences may also be dependent from the elicitation method used [Starmer 2000]. As their elicitation is primarily guided by the advisor, the client is subject to potential opportunistic manipulation. For example, advisors may exploit framing effects [Tversky and Kahneman 1981] and present choice problems in ways that influence the client's decision (e.g., suggestive questioning such as "you are certainly familiar with stocks?") [Oehler and Kohlert 2009:100].

Also, when mapping the client's needs and preferences to the solution space, advisors may act opportunistically, e.g., by engaging only in superficial solution search, i.e., simply categorizing clients and select the best option associated with the respective category [Jungermann 1999:4]. Such "default" options are "one-size-fits-all" and thus may provide inadequate solutions to the client – also, the client is inhibited to carefully consider other, more adequate solutions [Agnew and Szykman 2005:58]. As advisors will typically explain and justify their recommendation but not show how they came to the solution [Jungermann 1999:6], the client will not even notice the advisor's short cuts in providing his recommendation. The problem-solution gap makes it difficult for the client to comprehend the advisor's solutions or potential alternatives, let alone evaluate their quality. Also, whether or not the advisor invests further effort in adapting the solution to the client's individual needs lies at the discretion of the advisor.

7.2.3 Problem Summary

From the discussed characteristics we may synthesize the following main problems (P) as they occur in client-advisor encounters.

P1. *The problem of concealment*: Clients may (partly) observe the advisor's actions but may not – due to concealed information regarding in respect of the advisor's solution space and knowledge asymmetry – evaluate their quality (hidden information); e.g., for needs elicitation, the client may (partly) observe the agent's actions (e.g., regarding his information gathering strategy) but may not be able to infer its quality. Also, the

client may observe the output but not the advisor's actions, thus making it difficult to evaluate the recommendation's quality.

P2. *The problem of diverging goals*: Advisors are agents in at least two principal-agent relationships (organization and client) and thus under contract with two principals who may provide them with potentially conflicting goals (interest asymmetry). Such conflicts may encourage moral hazard of advisors. Advisors may take advantage on information and knowledge asymmetries that inhibit the client of monitoring or verifying his actions. For example, advisors may opportunistically invest insufficient effort in the solution-finding process in order to improve "efficiency" or over-provide products that increase their earnings but are inadequate in respect of the client's needs.

P3. *The problem of undissolved advisory complexity*: The quality of advice is a function of the solution matching with the client's needs, goals and preferences. Clients may find such information difficult to express and/or may be enabled to develop them only in the very process of elicitation. Furthermore, mapping the obtained client information to the advisor's solution space may be incomprehensible for the client for two reasons; firstly, the client may experience a gap between her articulated needs and the advisor's solution because of hidden information and hidden action; secondly, and quite inversely, the client may not be able to understand the mapping because of bounded rationality, i.e., her lack of knowledge and/or information overload.

P4. *The problem of low controllability*: Advice and recommendation emerge from client-advisor interaction and are thus co-created from inputs of both parties. Due to information and knowledge asymmetries (or advisor opportunism), however, the lay client may not be able to control the co-creation process and contribute as much as necessary to co-create an individual solution; thus, control over most activities and choices is left to the advisor, de facto making him the primary decision maker.

In general, agency theory suggests two main solutions for a principal to address agency problems [Eisenhardt 1989]. Firstly, the principal may contract on the outcomes of the agent's behavior and co-align the agent's preferences with those of the principal. However, as outcomes are only partly a function of behavior, this uncertainty introduces risks that are transferred to the agent. In consumer-service provider relationships, risk sharing between principal and agent may be achieved with price mechanisms [Singh and Sirdeshmukh 2000:152]. Consumers who are interested in high

quality services will be willing to pay price premium as a way of decreasing opportunism of the provider; while opportunism may seem advantageous for agents in the short-term, they risk loss of price premiums if their opportunism is revealed by customers. However, such conditions do not help to reduce information asymmetry experienced by the principal, but merely allow him to cope with ambiguity [Singh and Sirdeshmukh 2000:153] and, thus, are only addressing the problems of diverging goals and implied moral hazard.

Secondly, principals may attempt to monitor the agent's behavior, e.g., by investing in information systems – in organizational management (focusing mainly on employer-employee relationships), it has been suggested to control agent opportunism using information systems such as budgeting systems, reporting infrastructures, boards of directors and additional layers of management [Eisenhardt 1989:64]. Such information systems, however, seem to mainly address agent opportunism towards the organization – in service exchange settings, the client may not have the power to introduce further information systems to monitor her advisor. However, as we suggest in the next section, information systems that mediate advisor-client interaction may play an important role in alleviating agency problems in advisory encounters by enabling transparency.

7.3 Transparency as General Solution Approach

The notion of transparency has been discussed in different research fields with various meanings and levels of concreteness. In economics, for example, market transparency has been defined as the "level of availability and accessibility of information about products and market prices" [Granados et al. 2008:730], and "complete transparency" described as a feature of perfect competition. In the domain of management science and corporate governance, for Bessire [2005:426] transparency is another – however, not frequently used – notion for "information asymmetry".

A comprehensive, yet more specific and therefore more appropriate definition in the context of this essay, however, comes from political science research [Mahoney and Webley 2004:5]: "Transparency refers to the accessibility of the processes involved in decision making in addition to the outcome and to information itself. Transparency also involves proactive dissemination to the consumer of this information, knowledge and access."

7.3.1 Effects of Transparency

The definitions above at least imply that increasing the process and information transparencies of one party in a relationship should increase control and comprehensibility of the other. We argue that information, knowledge and interest asymmetries in principal-agent relationships should justify transparency (in respect of increased comprehensibility) as an end in itself. Furthermore, research suggests that individuals show a general preference for transparency and that a lack of it may have significant negative effects on relationships, e.g., regarding the client's satisfaction and her perceived trustworthiness of the provider.

The general (and sometimes irrational) preference for transparency has been discussed in the behavioral finance literature as "ambiguity aversion" [Camerer and Weber 1992:325], meaning that individuals appreciate "ambiguous" situations (having no information about the probability distribution) less than "risky" situations (knowing the probability distribution of the event), and are normally willing to pay to avoid ambiguity [Stracca 2004:382]. Carter and Curry [2010] find similar evidence in their research on transparent pricing, showing that individuals prefer products with transparent prices (showing allocation of costs to different supply-side parties) over their non-transparent counterparts and are willing to pay premium prices for such products.

Andersson and Holm [1998] theoretically explain this behavior with the improved falsifiability of transparent information (analogous to Popper's postulation that scientific theories need to be falsifiable). The authors provide a resolution to the paradox of Ellsberg [1961], who had demonstrated that individuals – having to choose from two alternatives, e.g., two lotteries – will in most cases prefer the alternative where the probability distribution is known. Such preferences, however, may violate the independence axiom of expected-utility theory. Andersson and Holm [1998] associate such "paradoxical" preferences with an individual's suspicion in situations where transparency is not warranted, and hypothesize that individuals are more inclined to suspect manipulation when falsification of the information at hand is more difficult.

Recently, first research has empirically investigated effects of transparency on (dyadic) interaction such as it occurs in client-advisor relationships. Positive effects of transparency reported or proposed in the literature are mostly related to increased satisfaction and increased perceived trust and fairness.

For clients in service encounters, Inbar and Tractinsky [2011] propose that establishing transparency (sharing information) may reduce the client's uncertainty and lead to favorable perception of the service provider's fairness and integrity as well as increase trust and satisfaction. In an empirical investigation of buyer-vendor relationships, Eggert and Helm [2003] found that relationship transparency, i.e., being informed about relevant actions and properties of an interaction partner, contributes to the overall success of a business relationship and increases customer satisfaction. Positive relations of transparency and trust have also been suggested by Adomavicius and Tuzhilin [2005:90] for personalization technologies in respect of explanations of recommendations – in their research on recommender systems, however, Cramer et al. [2008] did not find such effects. In the domain of e-government, Welch and Hinnant [2003] found that transparency is positively associated with citizen trust in government. Similar relations have been empirically supported for organization-employee relationships by Rawlins [2008]. Finally, Angluin and Scapens [2000] investigated levels of transparency of accounting in UK universities and found that only resource allocations with a high degree of transparency are likely perceived to be fair.

7.3.2 Transparency as Antidote against Asymmetries

Mahoney and Webley's [2004:5] definition already includes the most important concepts of how transparency may be applied to address the problems of client-advisor encounters; (1) accessibility of information (addressing hidden information); (2) accessibility of the process (addressing hidden action). Their definition also emphasizes that transparency involves these information to be disseminated *proactively*.

Let us first consider *information transparency*. In context of value co-creation, Prahalad and Ramaswamy [2004:9] suggest that firms' exploitation of information asymmetry between them and the individual consumers inhibits a meaningful dialog; for them access and transparency of information constitute central building blocks of co-creative interaction. Emphasizing on the interaction between advisor and client, Nussbaumer and Schwabe [2010] define information transparency as the degree of the client being enabled to monitor the information used as the basis of decision making. This facet of information transparency relates to the provision of relevant information for the client-advisor dialog.

Another facet of information transparency relates to the disclosure of information use. In respect of investment advisory services, Buhl et al.

[2007:15] argue that such information transparency may counteract privacy concerns of clients: if the provider reveals what information will be gathered (and for what purpose) prior to the consultation, the client may decide which (personal) information she is comfortable to provide. In the same vein, although in the domain of online personalization, information transparency has been conceptualized as giving consumers "access to the information a firm has collected about them, and how that information is going to be used" [Awad and Krishnan 2006:14].

We may summarize these two facets of information transparency in the context of advisory as follows:

> *Information transparency* := (I) the quality of information provision regarding the advisory information relevant for decision making, and (II) the degree of disclosure regarding what information is gathered and how it is used (i.e., for what purpose and what effect).

As suggested by the definition of Mahoney and Webley [2004:5], transparency also refers to the "process of decision-making", i.e., how a decision or recommendation is arrived at. We argued above that the current state of affairs in client-advisor encounters lacks such transparency (problem of hidden action) and thus impairs the client's comprehensibility of the process and its results as well as facilitates a high degree of advisor opportunism.

The importance of such *process transparency* has been stressed also by Eggert and Helm [2003:101] who subsume it under their concept of relationship transparency as "an individual's subjective perception of being informed about the relevant actions and properties of the other party in the interaction". Information about actions and explanation has also been found to be important for recommender systems [Adomavicius and Tuzhilin 2005:90], which are – in a way – the technological equivalent of advisors. Finally, in context of human-computer interaction, Grote et al. [1999:145] recognize process transparency as a premise of user control over information systems, i.e., the user's ability to see through the goals the realization of activities as well as to foresee the process (in terms of knowing when and how to interact). Such requirements have also been introduced for *interaction* transparency between user and computer system [Bardram and Bertelsen 1995].

Building on these conceptions and applying them to the context of client-advisor interaction, process transparency lends itself to address the problem of hidden action, i.e., opening the "black box" of advisory and showing what

the advisor is doing as well as how he is doing it. Taking this conception, we may thus define process transparency as follows:

> *Process transparency* := the degree of disclosure regarding how and why activities are performed.

Finally, as suggested above, making transparency the antidote of information asymmetries also requires *proactive* dissemination of information. At a first glance this seems rather straightforward and basically to involve implementing the first facet of information transparency: actively provide the client with all relevant information. Given the potential complexity and amount of relevant information, however, the crux of this simple solution reveals itself at the question of *how*. Clearly, the complexity of transparency requirements (e.g., transparently explaining the advisory process and its activities, their underlying information base as well as their effects while mapping the client's problem space to the advisor's solution space) will increase with the complexity of the advisory domain. Complexity may further increase with the premises that advisory encounters should be collaborative efforts (joint decision-making) and that, in order to make communication and cooperation between client and advisor effective, clients and advisors must be enabled to operate within a shared model of decision-making [Jungermann 1999:10]. To address such complexity, research has long-since pointed to collaborative information technology (IT) support (see next section), which we will apply as the basis of our solution approach to enable transparency.

We have argued above that transparency may be the antidote to asymmetries in client-advisor interaction. There are, however, some limitations to this. As a matter of fact, transparency may not solve the problem of diverging goals (and moral hazard) but may only influence their consequences in presence of the client. If it has adverse effects on the advisor's and organization's goal of maximizing profits, why would they want to increase the client's comprehension? Firstly, it should not be presumed that organizations and advisors act opportunistically as a rule. Neither is a product yielding profit for its provider inherently "bad" or unsuitable for the client. Transparency merely challenges advisors and organizations to optimize the product-client fit, and either to improve their products or put more effort into the solution-finding process. Given the proposed effects of transparency on the relationship between client and advisor (or organization), however, this loss should be compensated by the possible gains. Problems of diverging goals may also be addressed by an alignment of incentives, e.g., separation of

advice and its implementation and providing independent but fee-based advice. For investment advice such solutions are frequently discussed [Oehler and Kohlert 2009]. FSPs, however, have been countering such models by, e.g., bringing forward that clients lack the willingness to pay for advice [Mogicato et al. 2009].

Countering problems of moral hazard with transparency also shows philosophical implications. Even though the notion of transparency is predominantly used with positive connotations, there are also critics that call attention to its negative aspects. Bessire [2005], for example, warns against the most extreme form of transparency, panopticism, i.e., complete surveillance of individuals, probably without their knowledge. She finds that the most popular goal of transparency – inhibiting opportunism of individuals by discipline – in fact may have adverse effects on their behavior and the emphasis on opportunism create a self-fulfilling prophecy: "Transparency is assumed by its advocates to increase morality, but in fact it relies on a conception of man (a calculating and opportunistic individual), which appears in contradiction with this aim" [Bessire 2005:430]. There have been other proponents who challenge the premise of individuals behaving inherently opportunistic; such a conception of individual behavior has been countered with stewardship theory [Davis et al. 1997] that views agents as "good stewards" and replaces assumptions of opportunism and conflict of interest with those of cooperation and coordination [Shapiro 2005:268].

We emphasize that our solution approach is compatible with both views. Our conception of transparency primarily targets at comprehensibility of the process and its information for the client as an end in itself (and as a possible antecedent of increased control and satisfaction) – even if we drop the assumption of opportunism and moral hazard, the concept should be useful in dissolving information and knowledge asymmetries and improving the client's decision making. However, we also find that transparency may be an appropriate means to curb advisors from acting opportunistically against their client's interests (even if this was an exception to the rule).

7.3.3 Transparency and Collaborative IT Support

To capture complexity of shared task-solving and decision-making in the related domain of group work, research on computer supported cooperative work (CSCW) has long-since pointed to collaborative information technology (IT) support [e.g., Fjermestad and Hiltz 2000; Mittleman et al. 2008; Nunamaker et al. 1996]. In this body of research, collaboration

generally refers to people working together as part of a team for a common purpose and goal [Scaife et al. 2002]. Related research on design requirements to support such group work in both co-located [Arvola 2006; Isenberg and Carpendale 2007; Scott et al. 2003; Stewart et al. 1999] and remote settings [Baker et al. 2001; Pinelle et al. 2003] explicitly or implicitly assume *symmetry* of the actors' interests and goals.

Scaife et al. [2002], however, find a different kind of collaboration in sales-based transactions. Here, collaboration tends to be *asymmetrical*, with actors – customer and sales agent – following different but interdependent goals: "the agent wants to sell something to the customer and give them a satisfactory service, and the customer wants to get the best product that suits their needs" [Scaife et al. 2002:123]. To achieve their respective goals, the actors have to exchange information and collaborate. Scaife et al. [2002:124] find several differences of such collaboration compared to team-based collaboration: typically, in such service settings collaboration is rather one-sided, with one party (i.e., the agent) taking over the work and thus leaving the other party (i.e., the customer) highly dependent on him. Also, collaborators may be complete strangers (e.g., in the first service encounter) but have to build a shared understanding and mutual trust in a relatively short period time.

Based on such differences between service encounter collaboration and "traditional" team or group work, other research has focused on potential use of shared IT artifacts between customers and agents, e.g., for the domain of travel counseling [Halloran 2002; Novak and Schwabe 2009; Rodden et al. 2003]. In such settings, shared IT artifacts have been proposed to be useful to decrease both physical asymmetry as well as representational asymmetry between the actors [Inbar and Tractinsky 2011; Novak 2009; Rodden et al. 2003]. Physical asymmetry refers to the common practice in service encounters that information sources like software applications are positioned in front of the agent, typically disallowing the customer to see or interact with them. Enabling physical symmetry gives way to representational symmetry, providing shared "informational resources" that both the customer and the sales agent can refer to and make sense of [Rodden et al. 2003].

By mediating the transparent and traceable assignment of customer needs and preferences to product or service characteristics, such shared informational resources may also increase collaborative interaction and contribution of the client [Inbar and Tractinsky 2011; Novak 2009],

therefore supporting concepts of value co-creation between service providers and customers [Prahalad and Ramaswamy 2004; Vargo and Lusch 2004].
In this essay, we contribute to this latter strand of research by investigating the feasibility and usefulness of shared IT artifacts in co-located service encounters. Specifically, we provide an in-depth account of asymmetric collaboration in advisory contexts, presenting a novel solution approach for agency issues in advisory service encounters based on principles of transparency. We also present the first account of such a system for the domain of investment advisory services.

7.4 The Case of Investment Advisory Services

For the purpose of analyzing how transparency may be implemented in client-advisor interactions as well as evaluating their effects, we will exemplarily investigate investment advisory services in Switzerland. We focus on addressing asymmetry and transparency issues in such service encounters, and exclude other perspectives (e.g., user experience [Novak and Schmidt 2009], advisor training [Schmidt-Rauch and Geiger 2010] or financial literacy [Mitchell and Lusardi 2011]).
In this essay, we focus on investment advisory services for affluent private clients (with an approximate investment amount of 50'000 to 500'000 CHF). This segment marks the bottom end of the private banking market but is, given its potential growth, increasingly considered a lucrative market by FSPs [Molyneux and Omarini 2005]. To serve this client segment, most Swiss FSPs have established dedicated, structured investment processes [Mogicato et al. 2009]. These advisory processes provide assistance in defining strategic asset allocations according to the client's needs and risk preference as well as their tactical implementation with financial products.
While particular advisory practices of FSPs as well as relevant laws and regulations in other countries might be similar (e.g., for Europe) or not (e.g., for United States), our observations and conclusions should be generalizable to other countries in respect of general asymmetry issues between client and advisor (e.g., Germany [Hackethal et al. 2012; Oehler and Kohlert 2009], Austria [Hanke et al. 2006], United States [Krishnan et al. 1999; Mullainathan et al. 2011]).

7.4.1 Problems in Investment Advisory Encounters

Financial service providers (FSP) are facing fundamental challenges in performing their services – not only since the latest turmoil(s) in the financial markets. The avenue of new technological possibilities of service

provision such as Internet-based offerings has led to higher (market) transparency of service supplies and permitted a substantial reduction of costs, therefore also lowering barriers of market entrance [Buhl and Kundisch 2003].

To persist in the resulting competition, the most promising strategy has been found in differentiation against competitors [Buhl and Kaiser 2008; Porter 1998], which may be achieved by offering highly personalized, individual services [Buhl et al. 2007; Buhl et al. 2000; Dziarstek et al. 2004; Eberhardt and Zimmermann 2007], for these cannot easily be compared or imitated due to their dynamics and complexity. However, since the fundamentals of such services have not yet been established [Buhl and Kaiser 2008; Mogicato et al. 2009], FSPs have been counteracting cost pressure resulting from competition by optimizing their advisory services towards efficient and effective *product sale* rather than individualized *advice*. As a consequence, the quality of advisory services has been perceived as rather low and dissatisfying for customers [Evers et al. 2000; Jungermann and Belting 2004; Mogicato et al. 2009; Nussbaumer et al. 2011; Oehler and Kohlert 2009]. The main critique lies in the lack of transparency regarding the advisor's information and activities; clients perceive their advisors as a "black box" [Oehler and Kohlert 2009:93], and, maybe as a consequence, show little trust in them [Ennew and Sekhon 2007; Mogicato et al. 2009; Nussbaumer et al. 2011].

Legal frameworks have been developed to address execution transparency in financial advisory services and establish uniform regulations for consumer protection. For European markets, the most prominent example is the Markets in Financial Instruments Directive [MiFID; European Commission 2004]. Basic duties of allegiance, due diligence and information disclosure have also been defined for Swiss FSPs [FINMA, Eidgenössische Finanzmarktaufsicht 2008; Roth 2009]. Such legal duties require, for example, that the advisor collects all relevant client information and in turn provides her with all relevant information for the potential investment decision [Oehler and Kohlert 2009:98]. However, research has frequently pointed to weaknesses and failures of the legal frameworks [Jungermann and Belting 2004; Kohlert 2009], arguing that they show little effect on advisory practice because of their generic nature – being neither comprehensive nor specific enough – and their unrealistic assumptions regarding the client's prior knowledge and ability to comprehend the provided information [Oehler and Kohlert 2009:98–99].

In spite of the equivocal reputation of investment advisory services, they are used by the majority of investors [Cocca et al. 2009; Ernst et al. 2009]. As for other decisions, individuals seek financial advice for different reasons; e.g., lack of (up-to-date) knowledge regarding the financial markets, to receive reassurance or because of lack of interest or lack of time [Financial Services Authority 2002:15–17].

In the following, we will discuss issues of client-investment advisor encounters and relate them to the general problems of client-advisor relationships presented above. For this purpose, we shall start with a short characterization of how investment service encounters typically take place in Swiss banks. We base these observations on investigations of 37 Swiss financial service providers [Mogicato et al. 2009], including interviews with advisors, sales managers and IT managers as well as client focus groups and online surveys.

First encounter: In an exemplary investment advisory consultation, the client and the advisor meet in a designated consultation room. In the case of prospect clients, the advisor has minimal information about the specific needs of his vis-à-vis. Thus, for the first few minutes he will engage in small talk to gather basic information about the client (financial situation, needs and wishes), taking notes on his notepad. Throughout the remainder of the encounter, the advisor tries to gather as much information about the client's financial situation, her risk preferences, investment experiences as well as her interests in particular asset classes. Building upon this information, he will then suggest an investment strategy that proportionally attributes the client's investment to different asset classes (e.g., shares, bonds, money market). After some iterations of adapting this strategy to the client's preferences (e.g., increasing the amount of bonds and decreasing the amount of shares), the first encounter is finished (typically after up to 90 minutes). The advisor will propose to prepare a product portfolio for the agreed strategy, which will be either sent to the client (including material for establishing the contract) or discussed in a subsequent encounter.

Recurrent encounters: Once the client is satisfied with the specific product allocation, it will be implemented by the FSP and its performance regularly reported to the client. Typically, the client may either opt for an asset management mandate, where the FSP is in charge of all further decisions regarding product allocation and which is charged with an all-in fee, or actively adapt her portfolio herself (or by consulting her advisor), which is normally coupled with transaction-based charging. While in both cases the

advisor and client will meet at least once a year to review the portfolio's performance, only in the latter case will the client be able to actively influence and adapt the product allocation. During such a review meeting, adaptations to the portfolio are decided (e.g., selling of products and substitution by others) and implemented by the advisor, of which the client will be notified by an updated portfolio statement.

As most clients of investment advisory encounters are laypersons, the problems of information and knowledge asymmetry, i.e., concealment of information and actions, are fundamental (P1). In investigations of advisor-client interaction (e.g., in mystery shopping episodes [Mogicato et al. 2009]), we found that advisors literally speak a different language with an extensive use of technical terms. Relating the client's problem space of needs, goals and preferences to the advisor's vocabulary is further hampered by their intrinsic complexity (P3); typically, clients that seek advice have no concrete conception of their needs nor how to assign them to potential solutions [see also Oehler and Kohlert 2009:100]. For the discussion of appropriate investment strategies, the problem of bounded rationality and potential information overload emerges almost immediately: for each of the generic asset classes (e.g., shares or bonds), hundreds of sub-classes are defined; thus, the client is challenged to state her preferences regarding markets (home market or emerging markets?), industries (agriculture, manufacturing or construction?) or currencies (euros or US dollars?).

The "burden of choice" [Schwartz 2005] further increases when deciding on specific products from the myriads that are available for each asset class. Here, the advisor's task is to explain and – building on the client's needs, preferences and goals – reduce the solution space, so the client may choose from a smaller set of adequate solutions (products) (P3). This premise, however, gives way to the problem of diverging goals (P2). The client might not be able to understand the relation between her needs and the advisor's activities – are the proposed solutions in the client's best interest or does the advisor attempt to sell products he is obliged to by the bank's management?

Not understanding and comprehending the process and its results hamper the clients' contributions to the co-creation process (P4), i.e., taking her role of the primary decision maker. This also leads to the client's notion that she is not in control of the advisory process and the resulting solutions [Mogicato et al. 2009; Schwabe and Nussbaumer 2009].

7.4.2 Introducing Transparency to Investment Advisory Encounters

Given these issues of invest advisory services and the failure of the legal framework [Oehler and Kohlert 2009] to address them "top down", in this essay we suggest to improve the services at the locus of most issues – the client-advisor encounter. We will show how we iteratively developed shared IT artifacts to address these issues applying the general solution approach of transparent information representation.

The idea of applying IT to address advisory quality issues in advisory services is not particularly new. In recent years, Swiss FSPs have placed considerable efforts in trying to acknowledge the customers' critique by supporting advisors with standardized advisory processes and supportive IT systems; however, the lack of enforcement and monitoring leads to low adoption of the processes and their tools – especially for client encounters, IT tools consequently fail to be accepted [Schwabe and Nussbaumer 2009].

The newest IT systems also have little impact on the advisory quality perceived by their customers for mainly two reasons: they are either used in absence of the client (i.e., used by advisors to prepare consultations and evaluate them afterwards) and thus fail to provide transparency of the advisor's actions, or they are not used at all because of FSP's lack of enforcement and the incentives of the advisor [Schwabe and Nussbaumer 2009]. In practice, these IT systems are mostly related to customer relationship management (CRM) or portfolio optimization and simulation, targeting advisors as the sole users.

In scientific discourse, some focus has also been set on supporting advisors with mapping the customer requirements to appropriate investment strategies and products [Dziarstek et al. 2004; Eberhardt and Zimmermann 2007; Meier et al. 2007]. The (mandatory) use of such systems may in fact restrict the advisor from taking advantage of hidden action (e.g., recommending products not suitable for the client but attractive to the advisors in terms of provisions). However, these systems are designed to be used solely by the advisor and therefore do not contribute to enhanced transparency towards the client. Consequently, such systems do not fully address information and potential interest asymmetries.

As discussed above, however, information technology might play an important role in establishing transparency in client-advisor encounters, especially for complex advisory domains such as investment advice. IT-supported, shared information representations may mediate advisor-client interaction by providing relevant information regarding advisory content as well as process activities and their interrelations. This may allow for

enhanced transparency towards the client, while restricting the advisor to engage in hidden information or hidden action, paving the way for more suitable and satisfying advisory services.

7.5 First Build-and-Evaluate Iteration

The entry point of our first "design and build" iteration was problem-centered [Peffers et al. 2007:52], i.e., it started with an in-depth analysis of the status quo of investment advisory services. From interviews and discussions with advisors and clients (including interviews of 21 advisors from 19 FSPs, client focus groups totaling 28 participants as well as a client survey with 136 participants) [Mogicato et al. 2009], we could derive generic design considerations for transparent and interactive service encounters [Nussbaumer and Schwabe 2010].

Based on these considerations, we implemented an early proof-of-concept prototype with a group of four students as part of their Master's project [à Porta et al. 2009]. This application already featured the basic transparency design of the first prototype. To evaluate its design rationales, we discussed the prototype and its underlying concepts with representatives of four major Swiss banks. Their unanimously positive feedback encouraged us to enhance and functionally extend our prototype in order to evaluate it with real users. To get directions in revising the prototype and finding additional functional requirements, we conducted three focus groups of overall 15 domain experts (one focus group each for investment advice experts, financial software developers as well as interaction design experts). Based on their input, we built a functional revision of the student prototype that we will report on in the following. Design and evaluation results of this prototype in respect of process transparency and controllability are based on their presentation in Nussbaumer and Matter [2011] and, partly, Nussbaumer et al. [2012b], whereas in this essay we also present results regarding the clients' perceived quality of information provision (information transparency I).

7.5.1 Solution Objectives

In design research endeavors, solution objectives relate to the question of what a better artifact would accomplish [Peffers et al. 2007:54]. In general, our research seeks to solve the organizational problem of low client satisfaction in advisory services, which we ascribed to four problems of client-advisor encounters summarized in Section 7.2.3. We argued that problems of concealment (hidden information, hidden action; P1) negatively affect dissolution of advisory complexity (P3) and inhibit client contribution

to the process and its results (P4). These issues may be intensified in the presence of diverging goals (P2). As discussed above, however, the problem of diverging goals may not fundamentally be solved by IT artifact design. Making information and action transparent, however, should effectively restrict moral hazard at least in presence of the client.

The basic solution approach of transparency strives to alleviate concealment of information and action as the principal issues of advisory encounters, thus also increasing the client's comprehension and control.

For the design of the solution artifact, we define four solution objectives (SO).

SO1. Increase process transparency. Relating to our definition of process transparency as "the degree of disclosure regarding how and why activities are performed", this solution objective addresses the following problems:

- *Problem of concealment* (P1): Increasing process transparency relates to making the process activities and the advisor's actions transparent, i.e., allowing the client to monitor and better comprehend them.
- *Problem of diverging goals* (P2): Constricting the advisor in concealing his actions and making them transparent for the client deters moral hazard in the advisory encounter.
- *Problem of undissolved advisory complexity* (P3): Increased process transparency implies the provision of comprehensible representations of relevant information regarding advisory activities. Comprehensibility relates to the representations dissolving the inherent complexity of the advisory process activities and increasing the client's comprehension thereof.

SO2. Increase information transparency. We have defined information transparency above as being related to (1) quality of information provision as well as (2) the degree of disclosure regarding what information is gathered and how it is used. As a starting point for our first design iteration, we focused on the first aspect of improving information provision of advisory content for the client, thus addressing the following problems:

- *Problem of concealment (P1)*: Providing clients with access to the advisor's information counteracts the problem of concealed information.
- *Problem of undissolved complexity (P3)*: Providing information in a way that is comprehensible and useful for the client helps to dissolve the complexity of information and its use.

SO3. Increase controllability. Arguably, increasing process and information transparency, i.e., improving the client's comprehension of advisor activities and their information and thus reducing advisory complexity, should also better enable her to actively contribute to activities and co-create advisory results. While such transparency can be seen as a premise of such co-creation [Prahalad and Ramaswamy 2004], we intend to further address the *problem of low controllability* (P4) in our design. Thus, we include increased controllability as a solution objective.

SO4. Increase overall client satisfaction. In general, our solution seeks to address the issues of client-advisor encounters in order to solve the business problem of low client satisfaction. Thus, designing solutions to attain SO1-SO3 should also help to attain increased client satisfaction.

7.5.2 Design and Development

The solution objectives define what the solution artifact should accomplish. From our theoretical considerations (see above) as well as focus groups with investment advisory experts we defined several design requirements (DR) of what the solution artifact has to afford in order to fulfill the solution objectives. Like solution objectives address different facets of several problems, a particular design requirement may address several solution objectives. As we define SO4 as a consequence of SO1-SO3, our design requirements explicitly address only the latter.

7.5.2.1 Design Requirements

We have already argued that information asymmetries between the actors may be addressed with shared informational resources that both client and customer can refer to and make sense of, promoting joint exploration and planning [Rodden et al. 2003:59]. As such, we argue that shared information spaces are a premise of shared information provision and access (SO2, SO3) and allowing the client to observe and monitor the advisor's actions (SO1):

DR1. Provide shared information spaces

Clients perceive advisors and their actions as somewhat unpredictable ("black box"). Thus, they should be enabled to better comprehend the performed activities and their succession and to keep track of the progress (SO1). Such increased transparency has been proposed to also positively influence satisfaction [Inbar and Tractinsky 2011]. However, in order to integrate well into the advisory encounter, the shared representation should not constrict the advisor in adapting the advisory process (e.g., order of activities) to a specific client, nor restrict the client in contributing to the

process (SO3). In the past few years, organizations have been trying to establish advisory process guidelines and respective IT tools in order to standardize advisory activities [Mogicato et al. 2009; Schwabe and Nussbaumer 2009]. While some advisors find such prescribed processes and tools supportive for their advisory practice and helpful in adhering to organizational requirements, others feel that such prescribed processes and tools are a means of organizational control, restricting their advisory practice and negatively affecting their interaction with clients [Schwabe and Nussbaumer 2009]. Such notions of control are reminiscent of Suchman's [1994] observation that system design may carry with it "an agenda of discipline and control over organization members' actions" [p. 177]. To minimize advisor disapproval of such systems on grounds of organizational control and restriction, the supportive artifact should allow appropriate degrees of freedom for the advisor and client to adapt system use to the situational needs of the encounter. We constrain our design requirement by this observation:

DR2. Provide comprehensible visualizations of activities and their relationships
Constraint 1: Allow actors to customize the course of advisory

To attain SO2, the solution should provide relevant advisory information, i.e., counteract their concealment by making them available to the client and visualizing them in a way that is comprehensible and helps the client to dissolve its complexity:

DR3. Provide comprehensible visualizations of relevant advisory information

The transparent and shared informational resources should ease the client's contribution to the solution-finding process in order to increase her control of the process and its results (SO3). This also includes simplifying the client's obtainment of relevant information [Agnew and Szykman 2005:57] (DR3), enabling her to develop needs and preferences during the encounter, as well as easing comprehensibility of their mapping to the solutions while preventing information overload:

DR4. Enable the client to control the process and its results

7.5.2.2 Implementation

To enable shared information representation (DR1), we implemented the prototype application for a multi-touch tabletop device (Microsoft Surface). The tabletop device mediates and supports the most important activities of

the advisory encounter, which were based on actual advisory practice of Swiss FSPs. In doing so, relevant activities and their respective data architecture were elaborated and discussed with domain experts as well as key users (advisors, clients). As a general rule, and thus following the requirements of transparency (DR2, DR3), the system incorporated all activities and information directly or indirectly influencing the final recommendation. We included activities and information related to the following main phases of investment advisory sessions: needs elicitation, gathering of personal and financial client information, risk profiling and definition of investment strategy.

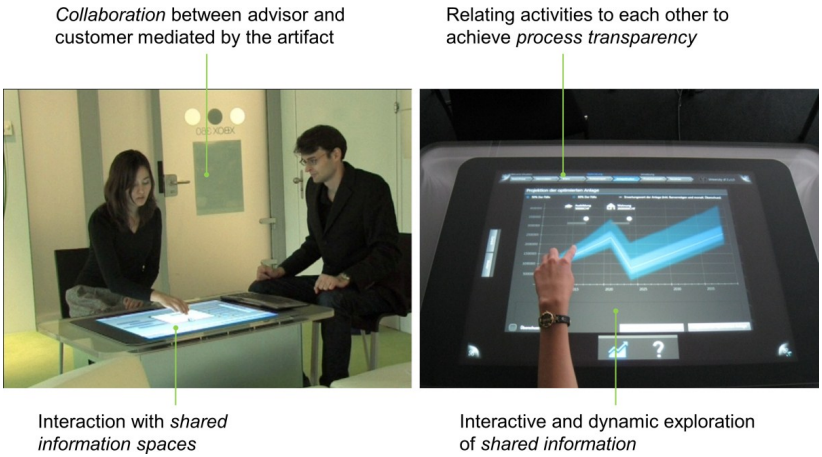


Figure 7-2: Interaction with the tabletop system

The tabletop device grants advisor and client with equal and transparent information access (DR3) and permits them to observe each other's actions, also allowing the client to take control and influence the process and its results (DR4). As we were equipping a situation traditionally based on pen and paper, we also assumed that the tabletop device would be perceived as less intrusive and less disruptive for social interactions compared to desktop or laptop PCs. Figure 7-2 gives an impression of how the tabletop application integrates into the advisory encounter and the suggested seating positions of advisor and client (based on the most frequent seating positions in the traditional advisory setting). A detailed account of the usage scenario between advisor and client can be found in Appendix A1.

We implemented the shared information representation (DR1) to only provide "public" information and activities, other than suggested by some

CSCW literature [Scott et al. 2003]. For client-advisor encounters, we argue that featuring private or semi-public spaces for the advisor – not observable by the client – would allow for concealment of information and action and thus weaken transparency.

Figure 7-3: Basic design of application front end

In order to address the requirement of process visualization and comprehensibility (DR2), we designed the front end of the shared information space upon the rationale of "representational guidance" [Suthers and Hundhausen 2003], a concept originating from computer supported collaborative learning (CSCL). There, visual representations such as process models [Carell et al. 2005] have been applied to support and enhance the organization of communication processes. Such a representation provides basic means of orientation and supports the cooperative enactment of the process, which should lead to increased knowledge exchange and integration [Carell et al. 2005] and may also serve as an external memory [Suthers and Hundhausen 2002:473] and enable cognitive offloading [Halloran 2002:5]. Thus, to support and organize the shared activities of the client and the advisor, we decided to implement a "map" representation of the advisory process, which can be monitored and controlled by both parties (Figure 7-3). To further increase comprehensibility and predictability of the process and

its activities, we decided to make it an anchor point of the application's information and interaction design, being always visible on top of the shared information space.

Navigation through activities is achieved either through the shortcuts provided in the advisor cockpit (Figure 7-3, "next" and "previous"), if the advisor wants to progress along the "standard" process, or through the process map to enter specific activities. The application allows for different starting points as well as revisiting activities, allowing for changes and adaptations at any time. The visualization implies but does not enforce a specific process order (DR2, Constraint 1). In principle, any course of activities may be implemented without considering interdependencies. The application, for example, permits to create an investment strategy without having previously configured the client's risk profile in the respective activity. Even though eliciting the client's risk preference is an important cornerstone of investment advice, in certain cases such a course of actions may be perfectly valid. For more experienced clients, for example, risk preference may be determined without the provided questionnaire or in conjunction with defining the investment strategy. As the information space is also observed by the client, however, the advisor is inhibited to "skip" the activity altogether. As such, the process depiction also fulfills the function of a reminder or "nudge" to perform important activities, while leaving "how" and "when" to the actors.

The implementation of the shared representation addresses comprehensible information disclosure (DR3) and increases the client's contribution and control in several ways (DR4). Division of the process and step-by-step enactment of activities should reduce the amount of concurrently processed information, as the visualizations only provide information relevant for the specific activity. Figure 7-3, for example, shows the visualization and interaction possibilities of defining an asset allocation strategy for a given investment amount while accounting for risk-return trade off. As novel information visualizations may create learning overhead and thus outweigh cognitive benefits [Cox and Brna 1993; Halloran 2002:6], we also based the visualizations (graphs, pie charts) on conventional information representations that are also used in client information of Swiss FSPs.
Proceeding through separate activities should also decrease the burden of choice as the solution space narrows along the process. For example, the client's financial situation and goals as well as her risk preference will narrow the range of potential investment strategies. However, the process

depiction allows revisiting activities at any time to adapt decisions and supports the development of the client's needs and preferences during the process. To increase comprehensibility of the solution-finding process, we also provide the client with means of comparison. To compare her current situation with the optimized solution that is created in the encounter, for example, a visualization of the projected growth – based on the information provided by the client and contextualized with her goals – may be accessed at any time (Figure 7-2, right).

7.5.3 Evaluation

The goal of evaluating a designed artifact is to investigate whether it achieved the solution objectives [Peffers et al. 2007:54]. We expect the benefit of the artifact to be twofold; firstly, we hypothesize that the artifact achieves its solution objectives of increasing both the client's perceived process and information transparency of the investment advisory encounter, as well as her perceived controllability thereof. Second, we also assume that improving transparency should increase the client's overall satisfaction with the client-advisor encounter. It has previously been suggested that individuals prefer transparent situations over their untransparent counterparts [Andersson and Holm 1998; Carter and Curry 2010], such that establishing transparency should lead to favorable perception of the vis-à-vis and increase satisfaction [Eggert and Helm 2003; Inbar and Tractinsky 2011].

In order to evaluate the utility of our design artifact in achieving these improvements, the evaluation was aimed to compare artifact-supported investment advisory encounters with traditional pen and paper investment advisory encounters, corresponding to current advisory practice in Switzerland. Thus, the study explores the artifact's utility in accomplishing its solution objectives by investigating the client's perception of the artifact-supported encounter with the traditional, unsupported encounter.

7.5.3.1 Method

Participants. The within-subjects evaluation was conducted with 4 advisors and 12 clients. We recruited the client participants by convenience sampling through postings on a university forum, therefore 8 of 12 participants were university students. Each client participant received 30 Swiss francs (equivalent to 34 USD at the time of the evaluation). The participants were between 21 and 50 years of age (M = 30.17, SD = 9.23), half of them were female, and five participants already were experienced with investment advisory services. All clients reported high proficiency in computer use, with 6 participants categorizing themselves as professional users and 5 as

advanced users; only one participant reported to use computers only occasionally.

The advisory sessions were carried out by four investment advisors of a single Swiss bank (3 male, 1 female). Their age ranged from 31 to 40 years (M = 34.50, SD = 4.04) and their advisory experience ranged from 4 to 7 years (M = 5.25, SD = 1.26). All of them classified themselves as being advanced IT users.

Procedure. On arrival, clients received written and verbal explanations about the test procedure. Each client participated in two test settings. One setting corresponded to the traditional advisory situation (pen and paper) that is typically performed by Swiss FSPs; the other setting was supported with the prototype application. To counterbalance the test settings, participants were randomly assigned to either start with the traditional or the artifact-supported setting (50% of participants each).

For both settings, client participants were asked to adopt the role of a customer in her first encounter with a new advisor. Their task involved the investment of a specific amount of money ranging from 250'000 to 500'000 Swiss francs (equivalent to approx. 279'000 USD to 559'000 USD), while considering two specific wishes and goals, e.g., purchasing an apartment or planning further education. The clients were provided with a profile including their role's key figures and assumed financial situation. To increase plausibility of the high investment amounts, the fictive financial backgrounds included large amounts of money the participants had inherited, been endowed or won in the lottery. To avoid advisor participants to familiarize with the settings, each client participant's financial background differed regarding the available assets as well as her needs and goals. Both the artifact-supported and traditional test sessions were limited to 30min.

On their arrival, advisors received a 30min hands-on training with the prototype software system. The advisors' task was to compile an appropriate investment strategy for the client's financial situation and goals using the prototype system at least once in the encounter. As portfolio compilation (i.e., implementing the strategy) is typically only accomplished in the second or third advisory encounter, for the test sessions the according functionality was deactivated and thus not used by advisors. The advisors took turns in advising clients in the traditional setting and the artifact-supported setting, such that in each setting clients were advised by a different advisor. For the traditional setting, advisors were asked to bring along supportive materials they would use for real client encounters. Some advisors supported the

traditional encounter with (standardized) presentations and brochures, while others only brought along their (analogous) notepad.
Data was collected through in-situ observations in both settings; in addition, the artifact-supported setting was videotaped and the advisory encounter audio-taped for the traditional setting. After their trials, clients and advisors were presented with questionnaires and debriefed in semi-structured one-to-one interviews. In this essay, we will focus the results of the client questionnaires and debriefings, referring to advisor feedback only to provide a different perspective on particular results.

Apparatus. Evaluations were conducted using the Microsoft Surface tabletop system (1st generation) to run the software prototype in the artifact-supported setting. In the traditional situation, advisors used their own advisory material and were also provided with notepad and pen.

Design and Analysis. The evaluation used a within-subjects design with setting (artifact-supported, traditional) as the main experimental factor.
According to the solution objectives, in the questionnaires clients were asked to assess the two investment advisory settings in respect of their perceived process transparency, information transparency and controllability as well as their overall satisfaction. The according metrics and measurements used in the evaluation are summarized in Table 7-2. Items were measured once for each advisory setting (traditional and artifact-supported) with seven-point Likert scales (1 = "I strongly disagree", 7 = "I strongly agree").
We defined process transparency above (Section 7.3) as the "degree of disclosure regarding how and why activities are performed". To support this notion, our artifact design aimed to open the "black box" of advisory encounters and increase the client's comprehension of the course of activities and comprehend their results. As a first exploratory metric, we decided to measure process transparency along the respondents' subjective assessment of their comprehension of the process order, i.e., *why* a specific course of activities is followed, as well as their comprehension of *how* the activities have been achieved. We operationalized the latter as the client's comprehension of how the final process results have been achieved.

Focusing on the first facet of information transparency (quality of information provision), we were interested in whether our artifact design could improve the client's perception of the information provided by the advisor compared to the traditional situation. We asked our participants to assess the provided information in respect of their perceived helpfulness, trustworthiness, usefulness and correctness.

Table 7-2: Summary of metrics and measurements used in the first iteration evaluation

Metric	*Measurement*

Perceived process transparency	• 2-item comprehensibility scale regarding process order and results measured on a seven-point Likert scale
	• Items
	  ○ Comprehensibility of process order: "I could comprehend at any time why the activities of the advisory session were following a specific order."
	  ○ Comprehensibility of process results: "I do comprehend how the results of the advisory session have been achieved."

Perceived information transparency (information provision)	• 4-item scale on perceived information provision measured on a seven-point Likert scale
	• Items: "Information provided in the encounter …"
	  ○ "… was helpful."
	  ○ "… was trustworthy."
	  ○ "… was useful."
	  ○ "… was correct."

Perceived controllability	• 2-item scale on perceived influence and participation measured on a seven-point Likert scale
	• Items
	  ○ Perceived opportunities to participate: "Overall, the advisory situation enabled me to participate in activities."
	  ○ Perceived influence on process: "Overall, I was able to influence the solution finding process of the advisory process."

Overall satisfaction with encounter	• 5-item satisfaction scale measured on a seven-point Likert scale [Briggs et al. 2008]

We based our metric of the client's perceived controllability on the notions of their perceived opportunities to participate (as a premise of control) and their perceived actual influence on the solution finding process.
Finally, we used the metric and measurements of the Yield Shift Theory of Satisfaction of Briggs et al. [2008] to measure overall client satisfaction with the advisory settings.

All Likert scale items were tested in respect of their internal consistency using Cronbach's alpha (Table 7-3). While the metrics of information transparency and satisfaction showed high construct reliability for both settings with all scores greater than the suggested cut-off value of 0.7 [Nunnally and Bernstein 1994], process transparency and controllability showed ambiguous reliability, with low Cronbach's alphas either for the traditional (controllability) or the artifact-supported setting (process transparency). Thus, averages of participants' responses were only computed for information transparency and satisfaction, while we evaluated the single items of the other metrics (process transparency and controllability). We qualitatively assessed construct validity [Straub 1989] by comparing

questionnaire responses with related open-ended questions in the interviews – within-subject answers regarding transparency, controllability and satisfaction between the different methods (questionnaire, interviews) showed high convergent validity.

Table 7-3: Scale reliability of metrics used in the first iteration evaluation

Likert scale metric	*Avg. rating traditional situation*	*Cronbach's alpha*	*Avg. rating artifact-supported situation*	*Cronbach's alpha*
Perceived process transparency	5.25	0.799	4.79	0.517
Perceived Information transparency (information provision)	5.65	0.923	5.21	0.917
Perceived controllability	5.33	0.218	4.25	0.937
Satisfaction	5.37	0.979	4.90	0.939

Except for the comprehensibility of results, all Likert scale and item data was significantly normally distributed according to Shapiro-Wilk tests on the differences between the settings' scores. Thus, for comparisons of scale or item data by setting (traditional vs. artifact-supported), we used dependent *t*-tests[23] (two-tailed) to test our hypotheses. To compare the ratings regarding the clients' comprehensibility of results, we conducted a Wilcoxon matched-pairs signed-ranks test (two-tailed).

All *p*-values were corrected for multiple hypotheses testing using the Benjamini-Hochberg procedure [Benjamini and Hochberg 1995]. The correction also accounted for the tests with non-significant results. To provide an objective measure of their importance, we also calculated the effect size for all scales revealing significant differences.

Throughout the evaluation, the client-advisor encounters of both settings were independently observed and protocolled in writing by two observers. They took notes regarding the interaction between client and advisor with an emphasis on their use of the software artifact (in the artifact-supported setting). To examine cases of contradictory protocol notes, the encounters' video and audio recordings were consulted.

The semi-structured participant debriefings contained questions regarding the overall perceptions of the advisory settings as well as further questions regarding the quantitative metrics to gather insights on the reasons of their ratings. All debriefings were audio-taped. To analyze them, we transcribed

[23] We therefore implicitly assume that the data can be treated interval.

the recordings and summarized all answers in a spreadsheet, where columns related to the questions of the interview guideline and each row represented one interviewee's answers. Similar to what has been discussed as thematic coding in qualitative content analysis [Flick 2007:402], we then analyzed the answers in two steps; first, we searched for topics and themes in single interviews (e.g., regarding perceived transparency, usability, satisfaction etc.). In a second step, we then compared and aggregated the topics for each question (column) and defined their central thematic structure (e.g., "perceived transparency generally lower for IT-supported setting").

7.5.3.2 Results

Perceived process transparency. Clients overwhelmingly provided positive comments on the shared visualization features of the prototype application, especially appreciating the possibility to compare the current and optimized situation regarding their potential growth of wealth. In respect of our solution objectives, however, the artifact-supported encounter did not live up to our expectations. Regarding the client's perceived comprehensibility, their understanding of the course of activities (process order) was rated slightly lower for the artifact-supported setting (M = 5.00, SD = 1.54) as compared to the traditional setting (M = 5.08, SD = 1.31). Comprehensibility of the process results was rated similarly, with much higher ratings for the traditional setting (M = 5.42, SD = 1.51) compared to the artifact-supported setting (M = 4.58, SD = 1.98). All differences, however, were not significant.
In the semi-structured interviews after their trials, clients brought forward several reasons for these unexpected results. Client participants found that the explanations of the advisor were better in the traditional setting, reporting that in the artifact-supported setting it was rather unclear how the charts and results of the IT artifact came about. Similar feedback was provided by the advisors – they reported that they had difficulties in explaining the visualized information, especially when charts contained multiple information dimensions.
Some client participants voiced critique regarding the high pace of the conversation in the artifact-supported setting, leading to information overload; another client found that the application required too much knowledge – this was confirmed by advisors who pointed out that clients were asking more specific questions, which were difficult to answer because of the clients' lack of knowledge. In the traditional setting, only two clients reported to have been overwhelmed by information provided by the advisor, five clients even arguing that the traditional setting's conversation was more

consistent and "smooth" and avoided interruptions caused by the use of the IT artifact. Hence, seven participants found the traditional setting more personal, perceiving the advisor being distracted by and putting too much focus on the artifact in the artifact-supported setting. Similar arguments were raised by the advisors, which found it difficult to maintain conversation while operating the application. This is consistent to our observations of the artifact-supported advisory situation, where we frequently found the advisor to be distracted by the application and neglecting face-to-face communication.

Information transparency. Regarding the provision of information the clients again rated the traditional situation ($M = 5.65$, $SD = 1.06$) higher than the artifact-supported situation ($M = 5.21$, $SD = 1.30$), but not significantly. As already indicated above, even though the visualization of information was generally found helpful, some clients argued that the provided information was difficult to interpret without advisor explanations. In contrast, they found explanations better in the traditional situation, where advisors could not rely on visualizations provided by the artifact.

Controllability. The client's perceived influence on the process was rated lower for the artifact-supported setting ($M = 4.00$, $SD = 1.60$) than the traditional setting ($M = 5.50$, $SD = 1.00$), showing a significant difference with large effect size ($t(11) = 2.691$, $p = .021$, $d = 1.15$). Also, clients found less opportunities to participate in the artifact-supported setting ($M = 4.50$, $SD = 1.68$) than in the traditional setting ($M = 5.17$, $SD = 1.40$), but not significantly.

In their feedbacks, only three clients believed that they could better influence advisory results in the traditional setting. Clients and advisors ascribed the lack of influence and control to their perceived authority of the visualized advisory process, feeling that they had to oblige the depicted course of advisory and that the encounter's solutions were restricted to those supported by the application. Indeed, our observations show that most users followed the depicted process and only a minority used the process depiction for alternate entry points or revisiting activities.

Satisfaction. Finally and – given the generally low ratings of the artifact-supported encounter – rather unsurprising, overall satisfaction with the advisory encounter was rated lower by the client participants for the artifact-supported ($M = 4.90$, $SD = 1.30$) compared to the traditional setting ($M = 5.37$, $SD = 1.51$). The differences, however, were not statistically significant.

Nevertheless, half of the clients stated that they preferred the artifact-supported setting.

7.5.4 Discussion

As we can see from our evaluation results, our first design iteration failed to accomplish the design objectives of increasing process and information transparency and thus improving the client's controllability. Indeed, quite the contrary proved to be true. Clients and advisors admittedly found the application helpful in supporting them with dynamic visualizations. However, visualizing the process map as an anchor point of the application led to a perception of the system "enforcing" the depicted process and constricting it to the given activities. Furthermore, visualizing one activity at a time and implying interrelations only through the process depiction failed to enhance the client's comprehensibility of the overall advisory process. In summary, our design was perceived as constraining control and disturbing conversation:

Perceived constrained control. Our basic design rationale of representational guidance was perceived by the actors as a *script* they had to adhere to, affecting their autonomy [Dillenbourg 2002]. Advisors experienced the system as being authoritative, feeling obliged to use the application's functionalities in the exact order of the depicted process, thus restricting interaction with the client to the set of supported activities. Along the same line, clients felt that the process was deterministic regarding the course of action and coverage of content and activities. Obviously, and in contrast to its intent of considering the specified constraint of DR2, our implementation was still perceived as carrying "an agenda of discipline and control" [Suchman 1994:177]. Furthermore, for the users the system seemed to confine their problem space to the type of problems the system could tackle, concluding that what they saw was all they could get.

Interruption of conversation. Our implementation of shared information representation shifted the attention of both the client and advisor to operating and monitoring the system. Feeling obliged to the advisory process depicted and supported by the application, the advisors experienced difficulties in dissolving from the system and maintaining face-to-face communication.

7.6 Second Build-and-Evaluate Iteration

Our first design approach clearly failed to accomplish our design objectives. Thus, we decided to initiate a second design iteration by revising and complementing our research objectives with the results and experiences from

the first. In order to increase input and feedback of actual users, we contextualized the second iteration with methods of scenario-based development [Rosson and Carroll 2002], which enabled us to iteratively refine the artifact requirements and their implementation. The iteration's demonstration of design requirements and their implementation partly builds on their presentation in Nussbaumer et al. [2012b].

7.6.1 Solution Objectives

The first iteration could not fulfill its solution objectives of increasing process transparency (SO1), information transparency (SO2) as well as controllability (SO3) and also failed to increase overall client satisfaction (SO4). Thus, we maintained these objectives also for the second build-and-evaluate iteration, with the goal to revise the requirements of how to accomplish them as well as their specific implementation.

For the second iteration, we complemented SO2 with the second facet of information transparency as defined in Section 7.3, i.e., the degree of the client being able to comprehend what information is gathered for what purpose and what effect. Thus, SO2 further addresses the dissolution of complexity of advisory encounters (P3) and increasing the client's comprehension thereof.

7.6.2 Design and Development

The solution objectives define what the designed artifact should accomplish. We ascribe the first iterations failure to accomplish its objectives on incomplete design requirements as well as their improper instantiation. Based on the results of the first iteration and the extension of SO2, we revised and extended our design requirements and their implementation as follows.

7.6.2.1 Design Requirements

As our conceptualization of transparency builds upon the notion of information sharing, transparent informational resources are fundamental. However, as the evaluation results of the first iteration show, the shared artifact seemed to influence the client-advisor interaction similar to a third party joining the encounter. Face-to-face communication between client and advisor shifted to operating the application and thus affected the social interaction between the actors. Thus, we introduced the constraint of acknowledging the sociable use of the shared information spaces and supporting rather than replacing face-to-face communication:

DR1. Provide shared information spaces
Constraint 1: Enable sociable use of the shared information spaces

Our findings of the first iteration suggested that building transparency upon rigid process visualizations may further the perception of authority and determinism. Also, the depiction of one activity at a time seemed to counteract our objective of increasing the client's comprehension of the activities' relationships. We therefore added two constraints to the second design requirement:

DR2. Provide comprehensible visualizations of activities and their relationships
Constraint 1: Allow actors to customize the course of advisory
Constraint 2: Avoid rigid representations of the process
Constraint 3: Avoid process visualizations that visualize only one activity at a time

In the first iteration, the solution objective of information transparency (SO2) focused on the quality of information provision and the client's according comprehension of the advisor's information base to dissolve advisory complexity. To also address the second facet of information transparency (disclosure of information use) in our extended second solution objective, we revised the third design requirement as follows:

DR3. Provide comprehensible visualizations of relevant advisory information and their use

While feedback on visualization possibilities regarding the comparison of future developments was unanimously positive, the first iteration's design did not improve comprehensibility of the solution-finding process. Furthermore, the client's perceived influence on the process and its results was rather low. We ascribe this perception of low control to our implementation of rigid representational guidance in the first design iteration, which was deemed authoritative and deterministic. Even though the process representation of the first artifact allowed for several entry points and different courses of activity operation, the basic design seemed to imply a specific order of activities that advisors and clients felt obliged to follow. Thus, we constrained the fourth design requirement as follows:

DR4. Enable the client to control the process and its results
Constraint 1: Avoid rigid representational guidance

7.6.2.2 Implementation

We found one main cause of the first design's failure in its basic rationale of visualizing the shared information representation, which seemed to "enforce" transparency while restricting the users' actions. Thus, in the second design iteration, we aimed at providing a more "casual" transparency design, which was inspired by Shneiderman's "visual information seeking mantra" [Shneiderman 1996]. The "mantra" suggests using the tasks of "overview first", "zoom and filter" and "details on demand" as a starting point for the design of graphical user interfaces. The application uses these tasks as basic metaphors for visualization and navigation.

Analogous to our first iteration, we implemented the second prototype application for the Microsoft Surface tabletop device, providing the same interaction scenario as depicted in Figure 7-2. Appendix A provides a detailed demonstration of the artifact's usage scenario.

Importantly, the artifact generally supports the same activities (and builds on the same data and information architecture) as the first iteration prototype, which are related to needs elicitation, gathering of personal and financial client information, risk profiling and the definition of investment strategy. Thus, most relevant design changes relate to the visualization of and interaction with the according information.

From representation of activities to "informational guidance". We fundamentally revised the design from the first iteration's *explicit* towards a more *implicit* process communication. The most evident change relates to the abandonment of the process representation (Figure 7-4). Instead, we address DR1 and DR2 by visualizing the shared information space with different levels of overview. In place of representational guidance regarding the supported *activities* (e.g., gathering personal information, needs analysis, risk profiling), we emphasize the relevant *information* blocks of advisory (e.g., personal information, needs, risk tolerance). Each information block may be "zoomed" in to allow more detailed levels of discussion. Basically, the application provides three levels of discussion that differ in their degree of detail and complexity.

The first and most abstract level contains a generic depiction of the advisory process (Figure 7-7 in Appendix A) – this level provides a common entry point to advisory and may be used to explain the general advisory approach and its relevant activities. The second and main level of the application provides an overview of information relevant for investment advice (e.g., regarding the client's cash flow, existing assets or risk tolerance), whereas

all information blocks are depicted as "widgets" around a central visualization of the projected assets growth (Figure 7-4).

Figure 7-4: Basic front end design of second iteration

The third level of discussion is provided by the "detail view" of each information block (shown for cash flow information in Figure 7-4). While the second level (widget overview) may be used to quickly add or change aggregated information, the detail view allows for an accurate investigation, e.g., to uncover inadequacies or missing information. Similar to the second level, changes or additions in the detail view will have immediate effects on the central visualization of the projected assets growth.

From progress by activity to progress by information. In opposition to our first design, displaying information blocks should not imply any restriction on the available activities to operate on them (DR2, Constraint 2). Such a presentation should avert the user's perception of observation or

control [Suchman 1994]. Rather than guiding them through a series of activities, the revised design provides indications of which information blocks the users should attend to. Changes of the risk preference, for example, might affect the investment strategy – if so, the application will notify the users that the strategy does not conform to the adjusted risk, thus suggesting that the users should attend to adapting the configured strategy.
To further enable adaptability in advisory progression (DR2, Constraint 1) and increase transparency of information and its effects (DR3), we introduced the principle of "overrides". In the second level view, the widgets' aggregated values may be "overruled" at any time, i.e., the calculated values (from the third level, detail view) may be changed to quickly simulate different scenarios or to express uncertainty (e.g., if no exact figures can be provided for existing assets or cash flow, the estimated aggregated values may be used as the basis of other widgets). This allows quickly changing specific information (widgets) and assessing related effects, while implying no specific order of progression and minimizing initial efforts of data entry.

From single to adaptable focus. Our initial design visualized information in respect of the displayed activity. The design coerced displaying and focusing particular information, while concealing other information as well as their possible interrelations. The "overview" design of the second iteration, however, allows for an unobtrusive way of providing all relevant information on the same screen and letting the actors decide on which particular information to focus. The overview also allows showing their relations between information and the activities performed on them (as demanded by DR3 and DR2, Constraint 3). Changing the aggregated value of the cash flow, for example, will have immediate visible effects on the central visualization, changing the projected growth of the client's assets; analogously, adding a financial need or goal in the respective widget will immediately add and contextualize it to the projection of the client's assets.
As depicted in Figure 7-4, focusing a particular information block (i.e., accessing its detail view) causes other blocks (widgets) to display relevant context information. For example, when advisor and client discuss the details of the client's cash flow, relevant information from widget "assets" (e.g., mortgage payments affecting the cash flow) and "personal information" (e.g., marital status and domicile, which will affect the cash flow in terms of taxation) are shown – in this way, the actors are provided with the relations between information blocks and may quickly assert whether all important information are available and/or correct. Focus might further be adapted by

increasing the size of information blocks as to emphasize on specific information, "stacking" information items that are currently not needed or even "pushing" them to the screen's margin to take them out of sight.

From advisor-system to client-advisor interaction. Regarding the sociable use of the system (DR1, Constraint 1), our design of a shared, transparent and adaptable information space should better support face-to-face communication by reducing "representational asymmetry" [Rodden et al. 2003:59] and therefore "preserve the salience of important social-interactional cues like attention, gaze and gesture" [Halloran 2002:29]. To ease the advisor's interaction with the application, we made comprehensive use of the tabletop's natural user interface and interaction features.

Widgets could be freely oriented and moved with one finger, while their size could be continuously increased and decreased using a "pinch" gesture (pinching two fingers or spreading them apart on the respective widget).

Furthermore, the main screen may be rotated using a gesture of two fingers at any time to orient all information elements simultaneously. This allows for 360 degree interaction, regardless of the user's seating positions.

To switch from the widget overview to the detail view the user would perform a "double tap" on the widget's title bar. Switching between the abstract level of process discussion (depicted in Figure 7-7, Appendix A.2) and the overview of widgets is accomplished by accessing a "hidden" menu (putting one finger anywhere on the screen for at least three seconds). Also, this menu includes invoking the "clean up" functionality which will set back all widgets' placement, size and orientation to the initial configuration.

In contrast to the first iteration, we also incorporated the advisor's physical notepad into the advisory situation. The rationale of this decision, however, is not grounded on creating an additional "semi-public" information space, but to allow phases of face-to-face communication without using the artifact. The advisor may engage in a dialogue with the client and make notes of relevant facts (which the client is able to monitor similar to the traditional situation) and then turn to the artifact to visualize information relations and effects. Such procedure, for example, should ease initial small talk and needs elicitation that could be distracted by the artifact.

To further strengthen the client-advisor interaction and communication, we also provide the advisor with an explicit gesture of "deactivating" the tabletop application; when putting his physical notepad (or any sheet of paper) on the tabletop screen, the screen grays out and is locked, i.e., prohibiting interaction with the displayed information. Also, in the training sessions, we provided the advisors with "best practices" of how to prevent

too much focus on the artifact or how to shift the client's attention from monitoring the artifact to facing the advisor. We found, for example, the advisor simply leaning back in his chair a strong communicative gesture to attract such client attention.

The application's design should also help improving the client's contribution and controllability (DR4). Progressing by information rather than activities and showing the immediate effects should improve the client's comprehension of the advisor's actions while limiting the perception of predefined processes and limited activities. To further increase comprehensibility of effects, the application offers different means of comparison. In addition to the central visualization presenting the projected growth of current versus optimized situation, the concept of "overrides" allows easy and fast simulations of alternate scenarios. Such functionality should enable the client to better reflect on her preferences and goals and thus support their elicitation and adaptation throughout the encounter. Furthermore, the improved interaction further supports the sociable use of the artifact (DR1, Constraint 1) as its usage consumes less time and attention.

As to better enable the client to monitor the information space and the advisor's actions, all information items are by default oriented to the client. This should positively influence the client's affordance of interpreting the visualizations and interaction possibilities, which has been shown to be affected by the viewing position [Wigdor et al. 2007]. Also, information items may be moved and scaled individually to put context-dependent focus and orient and move important information blocks to the client. Such dynamic orientation allows for strong communicative gestures [Kruger et al. 2004]. The free arrangement of information further enables adaptability (DR2, Constraint 1), supporting different work styles and enabling the creation and maintenance of basic mental models, which might be unique to the individual pair of actors [Isenberg and Carpendale 2007:1234].

7.6.3 Evaluation

Similar to our first design iteration, we evaluated the implemented artifact in respect of its four solution objectives; therefore, we maintained the associated hypotheses that the artifact-supported encounter would increase the client's perceived process transparency (SO1) and information transparency (SO2) as well her perceived controllability (SO3). We further maintained our hypothesis that increased transparency and controllability of the encounter will also increase client satisfaction (SO4).

Analogous to the first iteration, we tested our hypotheses in evaluation using experimental techniques, comparing the clients' assessment of artifact-supported investment advisory encounters with their traditional pen and paper counterparts.

7.6.3.1 Method

Participants. In our first iteration evaluation, we over-estimated the artifact's effect on the client participant's perception of the advisory encounter, leading to many non-significant results. Thus, in order to increase test power, we increased the sample size to 12 advisors and 24 clients.
The client participants were recruited by convenience sampling, 6 of the 24 clients were students. The clients' compensation was 50 Swiss francs (equivalent to 56 USD) for a total effort of 2.5 hours. Clients were between 21 and 64 years of age (M = 38.17, SD = 13.88), whereas 7 of them were female and 10 reported to have some experience with investment advice. Regarding their proficiency in computer use, 10 participants characterized themselves as professional users, 12 participants as advanced users and only one participant reported to use computers only occasionally.
The advisory sessions were again carried out by professional investment advisors from a single Swiss bank (10 male, 2 female) with their age ranging from 26 to 47 years (M = 37.58, SD = 6.64) and advisory experience ranging from 3 to 20 years (M = 12.46, SD = 5.85). Three advisors classified themselves as professional computer users, 7 as advanced users and only two advisors as occasional users.

Procedure. Using the same procedure as the first iteration, clients received written and verbal explanations about the test procedure. Each client participated in two test settings. One setting corresponded to the traditional advisory situation (pen and paper), the other setting was supported with the prototype application. To counterbalance the test settings, participants were randomly assigned to either start with the traditional or the artifact-supported setting.
Equivalent to the first evaluation, client participants were asked to adopt the role of a customer in her first encounter with a new advisor, involving the task of investing a specific amount of money while considering two specific personal financial goals or needs, e.g., purchasing an apartment or planning further education. The clients were provided with a profile including their role's key figures and assumed financial situation. To increase plausibility of the high investment amounts, the fictive financial backgrounds included large sums the participants had inherited, been endowed or won in the

lottery. To avoid time pressure in the advisory settings, the duration limit was extended from 30min (first iteration evaluation) to 45min.
Each advisor performed two client consultations in each setting, advising a total of four clients. Advisors took turns in advising clients in the traditional setting and the artifact-supported setting such that clients were advised by different advisors in each setting. For the traditional setting, advisors were asked to bring along supportive materials they would use for real client encounters (presentations, brochures, etc.). In order to increase the advisors' familiarity with the artifact, training was extended to include 60min of training 2-3 days prior to the tests, as well as 90min of hands-on training on the evaluation day. The training also included "best practices" of using the artifact with the client, such as avoiding too much focus or encouraging and activating the client to increase their contribution (see demonstration in Appendix A.2).
Data was collected through in-situ observations in both settings; in addition, the artifact-supported setting was videotaped and the advisory encounter audio-taped for the traditional setting. After their trials, clients and advisors were presented with questionnaires and debriefed in semi-structured one-to-one interviews. We will focus on the results of client questionnaires and debriefings, reporting results of advisor interviews only to provide further support for particular findings.

Apparatus. Analogous to the first iteration, evaluations were conducted using the Microsoft Surface tabletop system (1st generation) to run the software-prototype in the artifact-supported setting. However, in the artifact-supported encounter, advisors were additionally provided with notepad and pen. For the traditional situation, advisors again used their own advisory material and were additionally provided with notepad and pen.

Design and Analysis. Equivalent to the first evaluation, the evaluations followed a within-subjects design with setting (artifact-supported, traditional) as the main experimental factor.
In the questionnaires, clients were asked to assess the two investment advisory encounters for their perceived process transparency, information transparency and controllability as well as their overall satisfaction. The according metrics and measurements used in the evaluation are summarized in Table 7-4 and Table 7-5. Items were measured once for each advisory setting (traditional and artifact-supported) with seven-point Likert scales (1 = "I strongly disagree", 7 = "I strongly agree").

Table 7-4: Summary of metrics and measurements used in the second iteration evaluation

Metric	*Measurement*
Perceived process transparency	• 7-item process perception scale measured on a seven-point Likert scale, based on notions of process comprehensibility, predictability and ability to see through of Grote et al. [1999] • Items o Comprehensibility of procedure: "I could comprehend the course of the advisory session." o Comprehensibility of process results: "I do understand how the results of the advisory session have been achieved." o Ability to see through activities: "I could see through how the activities have been performed." o Ability to see through activity goals: "I could see through the goals of the performed activities." o Ability to see through activity interdependence: "I could see through the interdependences between the performed activities." o Predictability of when to intervene: "I could understand when to intervene in the performed activities." o Predictability of how to intervene: "I could understand how to intervene in the performed activities."
Perceived information transparency I (information provision)	• 9-item scale on perceived information provision measured on a seven-point Likert scale, based on items regarding completeness, representation, and composite information quality from Arazy and Kopak [2011] and items regarding relevancy from Lee et al. [2002] • Items o Completeness ▪ "The advisory situation included all necessary information." ▪ "The information provided in the advisory situation was complete." o Representation: "The information provided in the advisory situation was …" ▪ "… clear and easy to understand" ▪ "… presented consistently." ▪ "… formatted concisely." o Composite information quality: "The information provided in the advisory situation…" ▪ "… was of high quality." ▪ "… provided a good description of the topics." o Relevancy: "The information provided in the advisory situation was …" ▪ "… helpful." ▪ "… relevant."
Perceived information transparency II (comprehension of use)	• 2-item scale on comprehensibility of information use based on conceptualizations from Awad and Krishnan [2006] • Items o Comprehensibility of what information is gathered: "I could comprehend which information was gathered during the course of the advisory session." o Comprehensibility of gathered information use: "I could comprehend for what purpose the information was gathered."

Table 7-5: Summary of metrics and measurements used in the second iteration evaluation (ctd.)

Metric	*Measurement*
Perceived controllability	• 3-item scale on perceived influence and participation measured on a seven-point Likert scale • Items o Perceived influence on process: "Overall, I was able to influence the course of the advisory session." (adapted from first iteration) o Perceived opportunities to participate: "Overall, the advisory situation enabled me to participate in activities." (from first iteration) o Perceived influence on information use: "Overall, I could influence what information was used in the advisory session."
Overall satisfaction with encounter	• 5-item satisfaction scale measured on a seven-point Likert scale [Briggs et al. 2008]

Differences to the first evaluation relate to refined and extended metrics. We especially sought to improve the first iteration's exploratory metric of process transparency, which had shown ambiguous reliability. Thus, we constructed a new metric of process transparency – to cover further relevant aspects and to increase content validity [Straub 1989], we included additional notions of process comprehensibility, predictability and ability to see through. In the field of human-machine interaction, Grote et al. [1999] suggest these aspects to be premises of human control over technology.

Analogous to the first iteration, we measured comprehensibility as the client's subjective comprehension of the advisory process and its results; we operationalized the client's subjective ability to see through in respect of the activities, their goals and the interrelations between the activities.

Finally, we measured the subjective predictability of the encounter regarding the client's understanding of how and when to intervene in the advisory encounter.

Regarding the information provision aspect of information transparency, we improved our previous metric by basing them on existing items of information quality research. We chose to measure the clients' perceived completeness, representation and composite quality of information [Arazy and Kopak 2011] as well as their relevancy [Lee et al. 2002]. To measure the second aspect of information transparency (comprehension of information use), we constructed items based on conceptualizations of Awad and Krishnan [2006]. In their research, they relate information transparency to the customers' perceived importance of whether a company allows finding out what information it keeps about the client for what reason. To cover this

aspect of information use also in our metric of controllability and increase the metric's content validity, we added a further item on the client's perceived influence on information use.

Equivalent to the first evaluation, we used the scale of the Yield Shift Theory of Satisfaction of Briggs et al. [2008] to measure overall client satisfaction with the advisory encounters.

All Likert scale items were tested in respect of their internal consistency using Cronbach's alpha (Table 7-6). All scales showed high reliability for both settings with all Cronbach alpha scores greater than .755. We therefore computed the scale averages of the participants' responses. Qualitative assessment of construct validity by comparing the respondents' assessments of the main constructs in questionnaires and interviews showed high convergent validity.

According to Shapiro-Wilk tests on the differences between the settings' scores, the Likert scales of process transparency, information transparency I (information provision) and satisfaction were significantly normally distributed. Thus, for comparisons of these scale data by setting (traditional vs. artifact-supported), we used dependent *t*-tests (two-tailed) to evaluate our hypotheses. To compare the ratings of information transparency II (comprehension of use) and controllability, we applied Wilcoxon matched-pairs signed-ranks test (two-tailed).

All *p*-values were corrected for multiple hypotheses testing using the Benjamini-Hochberg procedure [Benjamini and Hochberg 1995]. The correction also accounted for the tests with non-significant results. To provide an objective measure of their importance, we also calculated the effect size for all scales revealing significant differences.

Throughout the evaluation, the client-advisor encounters of both settings were independently observed and protocolled in writing by two observers. They took notes regarding the interaction between client and advisor with an emphasis on their use of the software artifact (in the artifact-supported setting). To examine cases of contradictory protocol notes, the encounters' video and audio recordings were consulted.

The semi-structured client debriefings contained questions regarding the clients' overall perceptions of the advisory settings as well as further questions regarding the quantitative metrics to gather insights on the reasons of their ratings. Analogous to the first iteration, all debriefings were audiotaped, transcribed and summarized in a spreadsheet, which was then used to analyze the central themes emerging from the answers.

Table 7-6: Scale reliability of metrics used in the second iteration evaluation

Likert scale metric	*Avg. rating traditional situation*	*Cronbach's alpha*	*Avg. rating artifact-supported situation*	*Cronbach's alpha*
Perceived process transparency	5.28	0.879	5.54	0.911
Perceived information transparency I (information provision)	5.13	0.900	5.70	0.942
Perceived information transparency II (comprehension of use)	5.71	0.755	5.71	0.921
Perceived controllability	5.57	0.766	5.19	0.864
Satisfaction	5.33	0.953	5.72	0.972

7.6.3.2 Results

With the new artifact, the clients' assessments of encounter transparency and controllability were en par with the traditional setting.

Perceived process transparency. Perceived process transparency – the client's perceived comprehensibility of the process and its activities – was rated rather positive for both the traditional (M = 5.28, SD = 0.97) and the artifact-supported setting (M = 5.54, SD = 1.01). Even though the latter was evaluated slightly better, the differences between the settings showed no statistical significance. In their feedback, clients remarked that process transparency was positively influenced by the shared representation. Ten client participants found the artifact-supported setting to be more transparent, as the artifact provided a comprehensible overview of available information and provided them with immediate feedback. Only six clients clearly stated to prefer the traditional setting, arguing for its simplicity of presentation.

Perceived information transparency. In respect of the quality of information provision (information transparency I), the client participants significantly preferred the exposition of information provided by the artifact-supported setting (M = 5.79, SD = 0.97) over the traditional setting. The differences were statistically significant with large effect size ($t(21) = -3.387$, $p = .002$, $d = 0.73$).

The comprehensibility of information gathering and its purpose (information transparency II) was rated very positively for both the traditional (M = 5.71, SD = 1.15) and the artifact-supported encounter (M = 5.71, SD = 1.25), showing no significant difference. This perception was also mirrored in the clients' interview feedback, where they stated that they could easily understand why the advisor needed particular information.

Perceived controllability. Clients rated their perceived controllability in the artifact-supported setting rather low (M = 5.19, SD = 1.34) compared to the traditional setting (M = 5.57, SD = 1.14). In the interviews, however, clients generally perceived their influence to be equal in both settings; five clients stated that controllability was increased in the artifact-supported situation, whereas only two clients remarked that controllability of the traditional setting was superior. Regarding their perceived participation, some clients found more opportunities to ask questions in the artifact-supported setting. This matches also our observations that – due to the availability and visualization of information – discussions in the artifact-supported setting were more detailed and also more client-driven. This is also reflected in the duration of the encounters – while traditional encounters in general were finished after 20 to 30 minutes, the artifact-supported encounters often even exhausted the time limit of 45min.

Satisfaction. Overall, 60% of the clients preferred the artifact-supported setting over its traditional counterpart. In line with this preference, most clients also rated encounter satisfaction higher for the artifact-supported setting (M = 5.72, SD = 1.22) than the traditional setting (M = 5.33, SD = 1.10). These differences, however, were not significant. Generally, the clients preferred the artifact-supported encounter because of its clarity, improved information provision as well as its "playfulness", making the encounter more exciting. Compared to the traditional situation the artifact-supported setting was also perceived as "more professional" by some clients.
Only five clients remarked in their feedback that the artifact somewhat disturbed their interaction and communication with the advisor, due to focus on operating the artifact or perceived limitation by the artifact's functionality. Some clients also remarked that the availability of additional information in the artifact-supported setting was sometimes demanding or distracting; clients, however, did not report information overload to be an issue.
While these feedbacks matched our observations, we found major differences regarding our observations of interaction efficiency and usability and the client's subjective assessments. Most strikingly, in our observations we found that interaction with the tabletop device was rather error-prone and sometimes troublesome. Users exhibited problems with both (1) correctly applying the gestures to the designated information elements as well as (2) unintentional interaction.
Regarding the first aspect, we found our hidden gestures to be very demanding in respect of their mapping on interface elements. Especially, the

"double tap" gesture to access detail views of information items seemed problematic. Due to technical restrictions of the tabletop device (low resolution), enactment of the gesture was very error-prone – in absence of any system feedback, users seemed unsure whether their actions failed or they were using the wrong gesture. Often, this led to awkward situations with the advisor trying but failing to enter detail views and instead unintentionally moving or scaling information items, thus disorganizing the information space. Correspondingly, the single most used functionality was to "clean up" the screen, i.e., rearrange all items to their original positions.

Second, these interaction problems were aggravated by further unintentional interaction. Due to technological restrictions, the tabletop device could not discriminate between touch interaction initiated by a human finger or any other object of the same size. This led the application, for example, to recognize the contacts of the advisor's shirt-sleeve as interaction. Thus, advisors often unintentionally moved information items or reoriented the screen as well as accessed tools (calculator, further information, etc.) from the radial menus in the corners of the screen.

However, we were surprised to find that the majority of clients did not comment on such interaction problems – only four clients remarked that the advisor's interaction might be improved but ascribed the perceived problems to a lack of training. Similar feedback was provided by the advisors as the main users; while the majority of them reported to have had at least some problems with operating the system, they also ascribed it to their lack of experience, finding that these problems would diminish with frequent use.

7.6.4 Discussion

With adapting the basic design rationales of the application, we could successfully address the first iteration's issues of perceived determinism and restriction as well as the artifact gaining too much focus. In the evaluation, the artifact-supported encounter could also draw even with the traditional setting in respect of the client's perceived controllability. Interestingly, the second iteration basically provided the same functionality and information as the first one; however, grounding visualization upon information blocks rather than activities seems to have had less negative effects on the client's perception of control.

The new design, however, did not only affect the client's perception of the process but also improved interaction between actors. Similar to what has been reported by Halloran [2002], we found that the shard information space improved the quality of discourse, enabling more detailed and stimulating

discussions between advisors and clients as compared to the traditional situation. We ascribe this to the richer decision base that provided actors with detailed and dynamic contextual information. This is also supported by the clients' significantly higher rating of information provision for the artifact-supported setting compared to the traditional setting.

We also suggest that our design choice of providing "public only" information, along with the semi-public use of the advisor's physical notepad, further supported communication and interaction between the actors: For initial small talk or in more comprehensive discussions, the advisor would use his notepad to write down important information in order not to disturb the ongoing dialogue. Whenever the advisor wanted to contextualize this information with the application's visualizations, he would enter the data together with the client. While intuition suggests this redundancy to be annoying for both parties, we found that advisor and client were shifting quite fluently between discussions (and the advisor taking notes) and jointly investigating their effects using the system. These two levels proved to be a very good compromise to prevent actors from focusing on the system too much.

One may argue that it is already a success that the artifact-supported encounter accomplished to draw level with the traditional situation, given the large differences of advisor experience with the traditional situation (M = 12.5 years) compared to their experience with the prototype application (180min of introduction and training prior to the test encounters). However, the application could neither fully attain our main solution objectives of increasing transparency and improving the client's influence on the process, nor significantly increase client satisfaction with the encounter.

From observations, we suggest that this may also be highly related to the application's inadequate usability; failures in enacting gestures as well as frequent unintentional interaction were very prominent. These disturbances greatly affected the flow of client-advisor communication and put the actors' attention and effort to correct interaction with the system rather than the interactions' effects. We suggest that these interaction breakdowns also concealed interactional cues in respect of the advisory course and informational effects, potentially affecting the client's perception and comprehension of the advisor's actions, i.e., the encounter's transparency.

Interestingly, we found no direct support for this argumentation in the client participants' feedback – compared to the traditional encounter their perception of transparency regarding the artifact-supported encounter was rather modest but clients did not bring forward explicit reasons for this,

neither did they suggest improvements. To the contrary, some of them even downplayed interaction issues, arguing that such problems would diminish with increased advisor practice. However, to further investigate the suggested importance of "interactional transparency", i.e., users being enabled to easily follow each other's interactions with the system, we decided to initiate a third design iteration.

7.7 Third Build-and-Evaluate Iteration

Our first design iteration was initiated with defining the general issues of investment advisory encounter (problem-centered initiation); the second iteration targeted the same research problem with extended solution objectives and revised design requirements. Based on the objectives and requirements of the second iteration, the third iteration mainly focused on improving particular design aspects of the application, corresponding to a "Design & Development Centered Initiation" according to the taxonomy of possible research entry points by Peffers et al. [2007].
The demonstration of the third iteration's design requirements and evaluation results builds on their presentation in Nussbaumer et al. [2012b].

7.7.1 Solution Objectives

While the second iteration demonstrated promising results towards accomplishing its solution objectives, the designed artifact could not significantly improve the client-advisor encounter. Ascribing the artifact's failure to meet its solution objectives in the second iteration mainly to flaws in the interaction design, we attempt to accomplish the initial solution objectives of increasing process transparency (SO1), information transparency (SO2) and controllability (SO3) as well as overall client satisfaction (SO4) with extended design requirements and their adapted implementation.

7.7.2 Design and Development

The general artifact design of the second iteration showed some promise in improving the client-advisor encounter as compared to the traditional setting. Thus, the design and implementation of the third iteration focused on alleviating artifact issues related to its interaction design.

7.7.2.1 Design Requirements

Based on the results of our second design iteration, we suggest that transparency of advisor-application interaction may influence the comprehensibility of the encounter as perceived by the client. This

"interactional transparency" is not to be confused with the concept of interaction transparency in HCI research [Bardram and Bertelsen 1995], referring to users wanting to think about their tasks and not about the computer artifact they are using. In our context of dyadic interaction mediated by IT artifacts, we mean the comprehensibility of one party's system interaction as perceived by the other party.

We have suggested above that the second iteration's use of error-prone gestures might have affected the comprehensibility of the advisor's actions. The client's comprehension may have been further limited by the gestures' implicit or hidden nature – as learning the meaning of different gestures (one finger vs. two fingers, "single tap" vs. "double tap") was already difficult for the trained advisor, it is improbable that the incidental client user may easily map gestures to their proposed effects.

Therefore focusing mainly on the interaction with the artifact, we define the requirement of providing "interactional transparency" between users and the artifact to further the comprehensibility of interaction. As this requirement addresses the particular implementation of the shared information spaces, we add it as a constraint to our first design requirement:

DR1. Provide shared information spaces
Constraint 1: Enable sociable use of the shared information spaces
Constraint 2: Provide interactional transparency

7.7.2.2 Implementation

In our revised interaction design, we aimed at more comprehensible system interaction for both the user and the immediate observer. We introduced a physical token that – when being placed on the screen – could be used to more explicitly change information levels and application states and thus allow for increased attention and awareness of the observer. Placing the token on the screen activates a radial menu, mostly containing functionalities that were previously only accessible with hidden gestures.

For example, the menu allows switching between the abstract process representation level (see also Figure 7-7.1 in Appendix A1) and the overview level (Figure 7-5) as well as "cleaning up" the screen, i.e., resetting orientation and placement of the information widgets. Rotating the physical tag will rotate the screen, allowing for more intuitive screen orientation. Also, we included access to the advisor tools (calculator, information browser, session summary) into the radial menu, as their prior position (top-left and lower-right corner of the screen) caused frequent unintentional interaction.

To improve interaction with information items, we also replaced the "double tap" gesture with a tree menu on top of every widget that allows switching between detail view and overview.

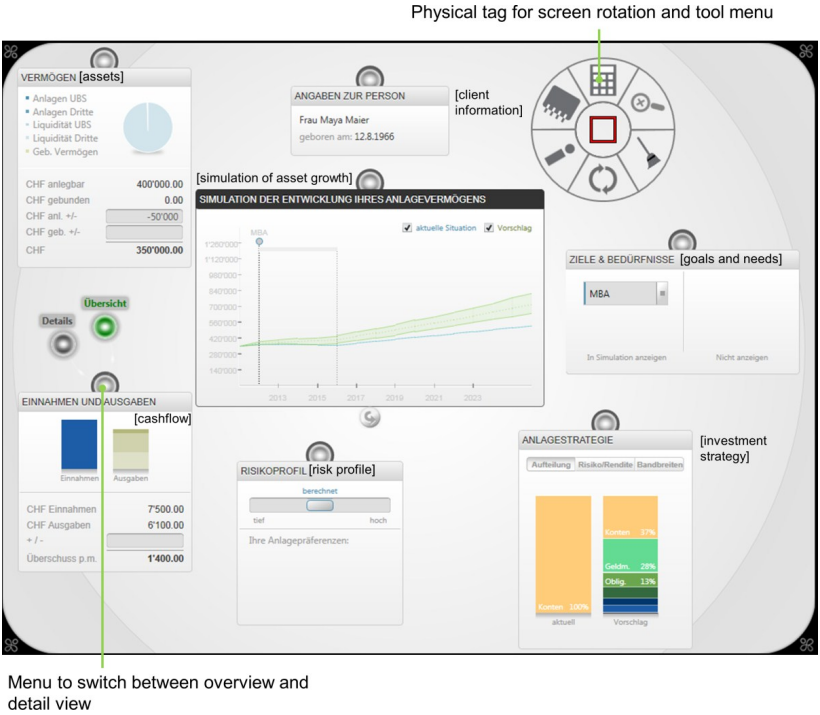


Figure 7-5: Basic front end design of third iteration

7.7.3 Evaluation

To test the third iteration's prototype application against our solution objectives, we conducted evaluations similar to the second iteration. We sought to test the same hypotheses as in the previous iterations, relating to improved transparency, controllability and client satisfaction in the artifact-supported investment advisory encounter compared to the traditional setting.

7.7.3.1 Method

Participants. We recruited 24 client participants by convenience sampling, 14 of them were students. Clients were between 20 and 52 years of age (M = 28.04, SD = 9.12), whereas 7 of them were female and 10 reported to have some experience with investment advice. Regarding their proficiency in

computer use, 11 participants characterized themselves as professional users, another 11 participants as advanced users and only two participants reported to use computers only occasionally.
The advisory sessions were carried out by professional investment advisors of a single Swiss bank (10 male, 2 female) with an age ranging from 27 to 55 years (M = 38.00, SD = 8.55) and advisory experience ranging from 2 to 30 years (M = 11.58, SD = 8.20). In respect of their proficiency in computer use, three advisors categorized themselves as professional users, seven as advanced users and two as occasional users.

Procedure. The evaluation applied the same procedure as the previous iteration, with two notable differences. To further increase the available time in the artifact-supported setting, we adapted the client's scenarios such that it included only one goal (e.g., buying a car) rather than two. In the same vein, the scenario specified that the client was already having an account with the FSP (so her existing assets were already available in the system) but utilizing the FSP's investment advisory service for the first time.

Apparatus. The same apparatus was used as in the second iteration evaluation. The artifact-supported setting was provided with the Microsoft Surface tabletop system (1st generation) running the software prototype. Additionally, advisors were provided with notepad and pen. For the traditional situation, advisors again used their own advisory material and were additionally provided with notepad and pen.

Design and Analysis. The evaluation mirrored the design of the second iteration, using the very same questionnaires and metrics as well as observation and debriefing guidelines (see above). Table 7-7 provides the metrics' scale reliabilities. All Likert scale items showed high reliability for both settings with all Cronbach alpha scores greater than .731. We therefore computed the scale averages of the participants' responses. Furthermore, qualitative assessment of construct validity showed high convergent validity of participant responses from questionnaires and interviews.
Shapiro-Wilk tests on the differences between the settings' scores revealed that all Likert scales were normally distributed, except for information transparency II (comprehension of use). We therefore used dependent t-tests (two-tailed) to compare the scale data of process transparency, information transparency I (information provision), controllability and satisfaction, while we applied a Wilcoxon matched-pairs signed-ranks test (two-tailed) to compare the ratings for information transparency II.

Table 7-7: Scale reliability of metrics used in the third iteration evaluation

Likert scale metric	*Avg. rating traditional situation*	*Cronbach's alpha*	*Avg. rating artifact-supported situation*	*Cronbach's alpha*
Perceived process transparency	5.27	0.926	6.05	0.919
Information transparency I (information provision)	5.02	0.945	6.38	0.923
Perceived information transparency II (comprehension of use)	5.46	0.917	6.42	0.818
Perceived controllability	4.83	0.731	5.96	0.833
Satisfaction	5.16	0.890	6.32	0.924

All *p*-values were corrected for multiple hypotheses testing using the Benjamini-Hochberg procedure [Benjamini and Hochberg 1995]. The correction also accounted for the tests with non-significant results. As for the previous evaluations, we also calculated the effect size for all scales revealing significant differences.

Analysis of the qualitative feedbacks followed the same strategy as the first two iterations. Again, the debriefings were audiotaped, transcribed, summarized and the answers analyzed for central themes.

7.7.3.2 Results

With improving usability and interactional transparency of the system, we observed advisor-system interaction to be much more fluent and comprehensible, allowing for more attention and focus on content rather than on how to operate the system. This is also reflected in the client's assessments of the artifact-supported encounter, showing all ratings being significantly higher as compared to the traditional setting.

Perceived process transparency. Clients assessed process transparency of the artifact-supported encounter ($M = 6.05$, $SD = 0.98$) to be highly increased compared to the traditional situation ($M = 5.27$, $SD = 1.28$), showing a statistically significant difference with large effect size ($t(22) = -3.847$, $p = .011$, $d = 0.69$). Similar to the second design iteration, clients found the shared representations and its visualizations greatly improving comprehensibility of the situation.

Perceived information transparency. Also, the assessment of perceived information transparency was increased. As in the second iteration, the quality of information provision (information transparency I) was significantly improved when using the IT artifact ($M = 6.36$, $SD = 0.65$) compared to the traditional situation ($M = 5.02$, $SD = 6.36$). The difference

between the settings was statistically significant with large effect size ($t(22) = -5.100$, $p < .001$, $d = 1.41$).
Furthermore, and in contrast to the second iteration, clients also reported increased comprehensibility of information gathering and its purpose (information transparency II) for the artifact-supported setting ($M = 6.42$, $SD = 0.75$), rating the traditional situation comparably low ($M = 5.46$, $SD = 1.44$). This difference showed to be significant with a large effect size ($Z = -3.222$, $p = .004$, $r = -.47$). Clients argued that this was mainly to the information representation that allowed them to enter client information whenever and they were relevant.

Perceived controllability. Regarding controllability, clients perceived increased influence and opportunities to participate for the artifact-supported setting ($M = 5.94$, $SD = 1.04$) compared to the traditional setting ($M = 4.83$, $SD = 1.27$). The difference was statistically significant and showed a large effect size ($t(22) = -3.553$, $p = .003$, $d = 0.96$). In their feedbacks, clients related their increased influence to the interactive development of the solution as well as the artifact's "playfulness" in allowing changing and adapting "everything" to their preferences.

Satisfaction. Overall, clients were more satisfied with the artifact-supported ($M = 6.32$, $SD = 0.74$) than the traditional encounter ($M = 5.16$, $SD = 1.30$), showing a significant difference with large effect size ($t(23) = -3.564$, $p = .003$, $d = 1.14$). Furthermore, 87.50% of the clients reported that they preferred the artifact-supported setting over its traditional counterpart (4.17% reporting no preference). Clients brought forward the following reasons for their preference: better comprehensibility and overview, innovativeness and "fun". However, the two clients who preferred the traditional setting argued that they were granted more speaking time, making the encounter more pleasant.

As compared to the second evaluation, the third evaluation's sample of participants was younger (mean age of 28.04 vs. 38.17 in the second evaluation) and consisted of more students (14 of 24 participants vs. 6 of 24 in the second evaluation). Thus, we investigated a potential sample bias towards IT support based age and occupation (student/non-student).
To investigate effects of the former, we computed the correlations between age and the main scales. For both the second and third evaluation the tests revealed no significant Spearman correlations (two-tailed) for our main metrics.

Regarding the influence of occupation, we tested both data sets (second and third evaluation) for different ratings between students and non-students (using independent t-tests where both groups were normally distributed, and Mann-Whitney *U* tests otherwise). The tests revealed no significant differences.

7.7.4 Discussion

Looking at the results, improving usability and interactional transparency greatly improved advisor-system and client-advisor interaction. Simplifying advisor-system interaction and replacing hidden gestures with interaction primitives more easily to be followed also increased the client's comprehension of the advisory encounter.

Introducing the physical token and the information widgets' tree menus served two purposes; firstly, it allowed us to increase usability of performing previously error-prone actions. Secondly, and maybe more important, the token allowed more explicit enactment of the underlying actions and provided stronger interactional cues; in this way, the token drew the client's attention to important advisor interactions and thus may have increased her comprehension of interaction effects and consequences. The revised interaction may also have led to our observed increased sociability of the client-advisor encounter, as the explicit interactional cues allowed the advisor to better shift and focus client attention.

Overall, the results suggest that the design rationales of process and information transparency are only effective if coupled with sufficient interactional transparency, i.e., sufficient client comprehension of the advisor's interaction with shared information representations. Interestingly, the majority of participants of the second iteration did not deem such transparency to be important – introducing this requirement was mainly based on our own sense-making of observations of advisor-system and client-advisor interaction.

7.8 An Initial Design Theory of Transparency

In this essay, we have suggested that client-advisor encounters are inherently strained by transparency issues, which show several negative effects on client-advisor interaction and client perception of the encounter. For these issues, we devised a general solution concept of improving transparency with shared IT artifacts. We instantiated and refined the concept in three build-and-evaluate iterations and showed its efficacy for the particular case of investment advice.

In the following, we will investigate the applicability of our design principles for general asymmetric client-advisor encounters, aiming to devise an initial design theory of improving transparency.
As demonstrated in Section 7.1.2, the components of such a design theory may be built on different activities of the design science research process. Based on the results and experiences of our three build-and-evaluate iterations, we suggest that our work is consistent with the requirements for design theory suggested by Gregor and Jones [2007]. Below we will summarize evidence from our current research for each of their proposed eight components, as they have been presented in Table 7-1.

1. Purpose and scope. This component specifies the type of artifact to which the theory applies, i.e., the goals and boundaries of the design theory.
The purpose and scope of our initial design theory of transparency relate to shared IT artifacts addressing the main issues of client-advisor encounters as discussed in Section 7.2, i.e., the problems of concealment, diverging goals, undissolved advisory complexity and controllability; it applies to shared artifacts that enable transparency of information and action between clients and advisors.
While the design theory's scope explicitly includes addressing the problem of diverging goals in client-advisor encounters (i.e., potential conflicts of interests regarding the goals of client and advisor), the design theory and its design principles may also be applicable for advisory services not or being less strongly affected by such interest asymmetry (e.g., fee-based advisory services that separate advice from implementation, medical advice or other services emphasizing information aggregation and provision).

2. Constructs. The design theory's main entities of interest refer to *process transparency* (comprehensibility of advisory activities, their order and their results) and *information transparency* (quality of information provision and comprehensibility of information use). We have suggested these constructs to be semi-independent components of the design theory, in that their designs may be carried out with some degree of independence.
The design theory also relates to the construct of *controllability* (the degree of the client being able to influence and control the advisory encounter and its results), which we argue to have some dependencies to the transparency constructs, both conceptual and design-wise. Conceptually, we have introduced transparency as a premise of controllability; only if the client is aware of the underlying mechanisms, will she be able to purposely take influence and control. In respect of the design, this dependence was reflected

in our focus on designing for transparency first and then – based on the overall transparency design – optimizing for controllability.

3. Principles of form and function. This component relates to the abstract "blueprint" that describes an IS artifact. Therewith, principles of form and function describe or prescribe how to design a solution artifact in order to achieve its objectives.

In our three build-and-evaluate iterations, we have defined and refined several design requirements to achieve our solution objectives. Based on our experiences of implementing and evaluating artifacts based on these requirements, we devise the design principles as technological rules [van Aken 2004] which should to be considered when developing IS artifacts to increase transparency in client-advisor encounters.

1. *Increase encounter transparency by providing the advisor and client with shared information spaces that both actors may access and monitor.*
   The shared information spaces should be implemented such that they enable actors to gain shared understanding of the problem and its potential solutions, while allowing them to monitor their respective actions and thus alleviating opportunism and hidden action. Thus, the information spaces should be shared and observable at any time. Being the basis of process and information transparency (see Principles 2 and 3), the shared information spaces should also allow the client to better co-create the solution and take influence on the solution-finding process.
2. *Increase the users' comprehension of each other's interactions with the shared information spaces by providing strong and easily identifiable interaction gestures.*
   Actors should be enabled to easily follow each other's interactions with the shared artifact. Thus, hidden interactions should be avoided in favor of more explicit interactions.
3. *Increase the client's comprehension of the advisory process by visualizing relevant encounter activities, their interrelations and results, but avoid rigid visualizations that may appear authoritative and deterministic.*
   Implementing process transparency should enable the client to monitor and comprehend the advisor's actions; thus, she should better understand the advisory results. From an advisor's perspective, the process-transparent artifact should ease explaining and arguing for specific activities and results.
   In order to prevent perception of authority and determinism, process transparency may have to be implemented implicitly, e.g., avoiding

visualizations that might be perceived as overly rigid (such as process flow charts or similar representational guidance).

4. *Increase the client's comprehension of advisory information by visualizing and dynamically adapting information relevant for advisory activities as well as their effects.*
   The implementation of information transparency in a shared IT artifact should include comprehensible provision of relevant information and their effects on the advisor's actions and advisory results. While the relevancy and comprehensibility of information may depend on domain and specific context, the continuous visualization of relevant information and immediate illustration of effects of informational changes (adding, removing, altering data) may ease comprehension of their purpose.

5. *Increase sociable use of the shared artifact and encourage face-to-face communication by allowing flexible artifact inclusion and exclusion from the client-advisor dialog.*
   Actors should be prevented from too much focus on the shared IT artifact at expense of face-to-face communication. Implementations of this principle may include the provision of several entry and exit points to the artifact's functionality such that artifact use may alternate with client-advisor interaction and dialog. Furthermore, autonomy of the actors should be supported by avoiding the shared artifact to explicate or imply rigid order of activities.

4. Artifact mutability. This component of a design theory refers to changes in the state of the artifact that may occur.

The specific implementation of the design principles in a shared artifact may be affected by several conditions. First, the instantiations may be highly dependent from the advisory domain. Requirements in respect of implementing process transparency and information transparency, for example, may vary regarding the complexity of the domain and the intensity of information, knowledge and interest asymmetries.

Another aspect of mutability also relates to the implementation of the shared artifact using specific technology. While our expository instantiations have been implemented for a multi-touch tabletop system, the design principles restrict use of other technology only by implication (e.g., given that the artifact and its information should be shared between client and advisor, some restrictions regarding visualization and interaction may apply). Their implementation, however, may be highly dependent from underlying

technology's characteristics such that the principles may have to be differently instantiated for different technologies.
Finally, artifact mutability does not necessarily refer only to technical changes of the artifact (such as feature extensions) or its potential application in other domains, but may also encompass the artifact's adaptability regarding actual usage. While our first iteration featured low adaptability to different user requisites (e.g., regarding free order of activities), our revised design immensely increased the user's possibilities to adapt the usage of the artifact to their specific needs and preferences. The design itself shows high mutability regarding its adaptability to different work practices.

5. Testable propositions. This component relates to propositions or hypotheses about the artifact against which it can be tested. We have tested three artifact iterations in evaluations using experimental techniques in order to test four hypotheses regarding the artifacts' effects compared to the traditional, unsupported situation. Based on these hypotheses, we propose that systems implementing the design principles will improve the client's perception of encounter process and information transparency. Furthermore, we propose that providing shared transparent IT artifacts may positively affect the client's perceived control of the encounter as well as increase her overall encounter satisfaction.

6. Justificatory knowledge. A design theory's justificatory knowledge relates to the underlying knowledge or theory that explains the artifact design. We have based our solution approach on several research fields (as discussed Section 7.2 and Section 7.3), built our artifact designs on existing collaboration literature and refined and adapted the respective requirements in three build-and-evaluate iterations.

7. **Principles of implementation**. This component entails the description of processes for implementing the design theory in specific contexts. In this essay, we have presented a design science approach to implement the theory in the domain and context of investment advisory encounters. This implementation process was based on the DSRM of Peffers et al. [2007] and used design methods suggested by Rosson and Carroll [2002]. The most important underlying principles of implementation relate to *iterative* development and *concatenation* of findings.

8. Expository instantiation. Expository instantiations of the artifact assist in representing the theory. In developing and refining our proposed design theory, we have developed three different artifact instantiations. The third artifact iteration may serve as an expository example of a successful

instantiation of our proposed design principles for the domain of investment advisory service encounters.

7.9 Conclusion

In this essay, we have suggested that client-advisor encounters exhibit agency problems of principal-agent relationships, which negatively influence the actors' collaborative solution-finding process. We addressed these problems along two main contributions. Firstly, we have demonstrated how we developed and refined design requirements of transparency in the exemplary domain of investment advice. Presenting our research findings along three consecutive design cycles, we emphasized on the strength of multi-loop, concatenated design processes in exploring solutions and their iterative refinement. Secondly, we have proposed a design theory that generalizes the requirements to design *principles* of addressing transparency issues in client-advisor encounters. Based on our evaluation findings, these principles do not only include patterns of improving transparency in client-advisor relationships but also "anti-patterns" of approaches probably to avoid.

Table 7-8 summarizes our three design iterations along their solution objectives, design requirements as well as the derived design principles. While all iterations shared the same solution objectives, the design requirements to achieve these objectives evolved with evaluating the design solutions. Findings of previous iterations were incorporated into following iterations as constraints regarding how requirements should be implemented. Based on three iterations of requirement refinement and implementation we then derived several design principles of how to best design for transparent, shared advisory support.

While our design iterations circle around implementing the design principles using shared IT artifacts, they do not necessarily imply any (information) technological imperative. For less complex scenarios, our transparency principles may also be implemented, e.g., on paper; the principles aim to improve the comprehensibility of the encounter through shared information spaces – as such, however, they do not make assumptions on how to (technologically) implement them. For the domain of investment advisory encounters, we have successfully built shared information spaces upon one particular technology (Microsoft Surface tabletop device); as these instantiations are domain-specific, they must remain exemplary – appropriate technologies and instantiations in respect of visualization and interaction may greatly vary across domains.

Table 7-8: Summary of design iteration objectives and requirements, and derived design principles

	Iteration 1	*Iteration 2*	*Iteration 3*
Solution Objectives *What should the artifact accomplish?*	**SO1**. Increase process transparency **SO2**. Increase information transparency **SO3**. Increase controllability **SO4**. Increase overall client satisfaction		
Design Requirements *What should the artifact afford to accomplish the solution objectives?*	**DR1**. Provide shared information spaces (SO1, SO2)	*Constraint 1*: Enable sociable use	*Constraint 1*: Enable sociable use *Constraint 2*: Provide interactional transparency
	DR2. Provide comprehensible visualizations of activities and their relationships (SO1)		
	Constraint 1: Allow actors to customize advisory course	*Constraint 1:* Allow actors to customize advisory course *Constraint 2*: Avoid rigid representations of the process *Constraint 3*: Avoid process visualizations that visualize only one activity at a time	*Constraint 1:* Allow actors to customize advisory course *Constraint 2*: Avoid rigid representations of the process *Constraint 3*: Avoid process visualizations that visualize only one activity at a time
	DR3. Provide comprehensible visualizations of relevant advisory information (SO2)		
	Advisor information base	Advisor information base & information use	Advisor information base & information use
	DR4. Enable the client to control the process and its results (SO3)		
		Constraint 1: avoid rigid representational guidance	*Constraint 1:* avoid rigid representational guidance
Design Principles *How should transparent shared advisory support be designed?*	**DP1**. Increase encounter transparency by providing the advisor and client with shared information spaces that both actors may access and monitor. **DP2**. Increase the users' comprehension of each other's interactions with the shared information spaces by providing strong but easily identifiable interaction gestures. **DP3**. Increase the client's comprehension of the advisory process by visualizing relevant encounter activities, their interrelations and results, but avoid rigid visualizations that may appear authoritative and deterministic. **DP4**. Increase the client's comprehension of advisory information by visualizing and dynamically adapting information relevant for advisory activities as well as their effects. **DP5**. Increase sociable use of the shared artifact and encourage face-to-face communication by allowing flexible artifact inclusion and exclusion from the client-advisor dialog.		

In this essay, we have demonstrated how such instantiations may be developed and refined using an iterative design process [Peffers et al. 2007]. For instantiating transparency implementation requirements in other domains of principal-professional relationships, we suggest that our design principles may provide a useful starting point.

Our research has implications for advisory practice regarding several aspects. With our conception of encounter transparency we address fundamental agency problems inherent in most client-advisor relationships. In contrast to other solution approaches discussed in the literature, our transparency approach intends not to compensate existing asymmetries with appropriate contracts but to more directly address and alleviate them by opening the "black box" of advisory encounters. Transparency may not only increase the client's comprehension of the advisory information and activities – and, thus, strengthen her decision making authority – but may also positively influence her perception of the overall advisory experience and improve satisfaction.

In this essay, we have mainly argued for the need of transparency from the client's perspective. Clearly, for advisory encounters previously aligned to be opaque in order to be profitable, introducing transparency also shows some ramifications regarding the role of the advisor and the service company's business model. For organizational stakeholders, transparency as a means to increase encounter comprehensibility may be a double-edged sword. On the one hand, improving client comprehension may not only increase advisory and decision quality as well as client satisfaction, but may also strengthen the company's position in respect of particular regulations on minimal information disclosure (e.g., European regulations for financial services [European Commission 2004]). On the other hand, such endeavors may counteract existing business models of cross-subsidizing "free-of-charge" advice with product sales, partly building on information and knowledge asymmetries in order to be profitable. However, such business models are not necessarily in opposition to improving transparency.

Increased client comprehension may compel companies and their advisors to be more convincing and persuading regarding their own products – at the advantage of potential competitive differentiation and increased client satisfaction. Also, as research has shown [e.g., Carter and Curry 2010], transparency may positively influence the clients' willingness to pay for advice, paving the way to alternative business models, e.g., separating fee-based advice from its implementation with products.

We will conclude this essay with some remarks on potential limitations. As in all research building on evaluations using experimental techniques, the validity of our findings is a function of the validity of the chosen test designs. We carefully designed our artifact evaluations to provide environments that are as realistic as possible. However, we acknowledge that many client participants were students rather than "real" investors. We argue, however, that preference for transparency should be a general feature of ambiguity-averse individuals [Andersson and Holm 1998], such that our results may also be applicable to the "population" of investors. Furthermore, we found no significant valuation differences between students and other client participants; neither did we find correlations between the participants' age and their evaluation of the main scales.

Another potential limitation relates to our transparency measurements. We only surveyed the clients' subjective comprehension of the encounter's information and activities; hence, we cannot know whether our transparency designs also increased their objective comprehension, e.g., in terms of learning. Anyhow, in the feedback interviews, we found no indications that the participant's comprehension of the advisory situation was low in either setting.

7.10 Appendix

A1. Demonstration of Prototypes

A.1.1 First Design Iteration

In the artifact-supported encounter, client and advisor seat themselves at the tabletop device rather than a regular table. While engaging in initial small talk, the advisor is enabled to transparently add the client's needs into an area at the center of the screen (Figure 7-6.1), assuring the client that her wishes, needs and preferences are taken seriously. To stimulate the client in thinking of her needs and goals, pictograms of basic categories (planned purchases, education, and housing) are readily available. Wishes and needs may be detailed with costs and contextualized with a timeline to express the desired period of goal fulfillment.

After having gathered and entered the information about the client and her financial situation in the respective activity screens (Figure 7-6.2 and Figure 7-6.3), the advisor and client will collaboratively discuss the client's risk preference along a simple questionnaire (Figure 7-6.4). The client and advisor may then evaluate the questionnaire's results and adapt it to the preferences of the client. The defined risk preference will then be used to

narrow down an appropriate investment strategy (Figure 7-3), which will be compiled by client and advisor along a defined investment amount and investment horizon.

Figure 7-6: Screens of first iteration prototype; (1) Needs elicitation, (2) Personal data, (3) Financial situation and assets, (4) Risk preference questionnaire, (5) Simulation of future growth, (6) Summary of activities; product configuration omitted

To assess the effects of an investment strategy (e.g., regarding accomplishment of the client's goals), the projection of the potential growth of wealth may be accessed at any time (Figure 7-6.5). The advisor acts as a coach trying to map the client's situation to appropriate strategies in order to fulfill her needs and goals. The dynamic visualization enables the advisor to comprehensibly argue for and against specific strategies, while the client can

immediately track the potential impacts on her financial situation and goal fulfillment.
As the process overview is anchored to the application's front end and allows navigation to all activities, the actors are enabled to refine and revise entered information at any time, allowing needs and goals to develop during the encounter rather than limiting their elicitation to a specific advisory phase. Having agreed on a strategy, the advisor may summarize the advisory session in a dedicated screen (Figure 7-6.6) that transparently shows all entered information and decisions made during the encounter. Based on this information and for a following encounter, the advisor may suggest a portfolio of products that may then be collaboratively discussed and adapted (not functionally implemented for the prototype and thus omitted in Figure 7-6).

A.1.2 Second and Third Design Iteration

The general setup of the second and third prototype is similar to the first iteration – client and advisor seat themselves at the tabletop system, whereas in general the client will sit at the long side of the tabletop such that all information elements are oriented to the client by default. The second and third prototype share the same front end design and differ mainly regarding their interaction primitives. While the second prototype implements several interaction gestures (double tap, two finger zoom, two finger rotation), the third prototype shifts these hidden gestures to a radial menu that can be accessed by placing a physical token onto the screen.
In the first few minutes of the encounter, however, the tabletop system will only be used as a table – client and advisor will engage in small talk, and the advisor will write down important information on his notepad. After this initial phase, the advisor will activate the tabletop system and present the general process overview to the client (Figure 7-7.1) to prepare the client in what to expect from the encounter and role of the IT artifact. Having discussed the general frame of the advisory session, the advisor may switch to the main overview (Figure 7-7.2) via a "hidden" menu that will appear whenever the advisor puts one finger anywhere on the screen for at least three seconds. In this overview, the advisor will briefly explain the visualized information, starting with client information (personal information, cash flow, assets), progressing with risk profile and investment strategy as well as explaining the role of the needs visualization and the projection of growth (central graph visualization).

The advisor will then start to enter the information gathered in and noted on his notepad in the first few minutes of the session, verifying the entered data with the client and showing effects on either other information blocks or the central visualization. When accessing the detail view of some information blocks, relevant information from other blocks will be visualized (e.g., when accessing the cash flow detail view, cash flow-relevant expenditure or income from existing assets and important tax-relevant information will be displayed, Figure 7-7.3). Using such information, advisor and client may verify whether all relevant data has been entered and which effects additional data might have.

After having discussed the client's risk profile (Figure 7-7.4) and client goals, the actors will define an appropriate investment strategy (Figure 7-7.5). As all relevant information is visible at any time, changes and their effects can be immediately assessed (e.g., effects of investment strategy on projected growth; effects of needs and goals on projected growth; effects of changes of client cash flow and assets). All information blocks may be accessed and adapted at any time – the application does not enforce any course of action.

The advisor and client may access additional tools using two identical menus available on the upper left and lower right corner. In addition to a simple calculator, the actors may also retrieve explanatory information through a help browser and information prepared by the advisor in a digital briefcase, also providing a summary of all accomplished activities and gathered information that may be compiled at any time. The latter visualization will be used by the advisor at least once in the encounter, namely to recapitulate the advisory session and provide the client with a printout or digital representation of the summary.

Figure 7-7: Screens of second design iteration; (1) General process overview, (2) Overview of relevant information blocks, (3) Detailed gathering of financial situation (here: cash flow), (4) Risk profiling, (5) Definition of investment strategy, (5) Supportive tools (calculator, information browser, session summary)

8 Essay III: Designing for Cost Transparency in Investment Advisory Service Encounters

Abstract

Investment advisory services of financial service providers (FSPs) exhibit several characteristics that are detrimental to advisory quality. The interaction of advisor and client is strained by a lack of transparency regarding the advisory process (what activities are performed and why) and the information used therein (what information is used for what purpose and with what effect), as well as regarding the precise costs of the service and the recommended products. In prior research, we suggested that process and information transparency issues may be appropriately addressed with collaborative information technology (IT) artifacts. In this paper, we argue that collaborative, transparent artifacts may also be a premise of enabling cost transparency. To this end, we describe a complete research cycle of designing, implementing and evaluating a shared cost-transparent IT artifact to support client-advisor interaction in investment advisory encounters. Evaluation results suggest the efficacy of our design in improving the clients' perceived cost transparency as well as increase their satisfaction and their willingness to pay for the received investment advice. These findings may also challenge the common belief of FSPs that transparent, fee-based advisory services would neither be accepted by clients nor be economically viable. Practical implications of these findings for designing advisory encounters with supportive IT are discussed.

8.1 Introduction

Investors are dissatisfied with their financial service providers' (FSPs) investment advisory services [Mogicato et al. 2009]. Indeed, to counteract cost pressures resulting from fierce competition, FSPs have been optimizing their advisory activities towards product sale rather than provision of advice, leading to a poor quality of advice [Jungermann and Belting 2004]. For investment advisory services, research suggests several characteristics that are detrimental to advisory quality, including information asymmetry, interest asymmetry and ignorance of the client's information needs [Oehler and Kohlert 2009]. Due to these asymmetries, the advisor might exploit the client's less knowledge and experience to opportunistically pursue his own goals (e.g., by only superficially gathering relevant information or deliberately presenting information in a way that is incomprehensible for the

client). From a client's perspective, such (possible) behavior is fostered by the lack of information disclosure, especially regarding the exact costs of both the investment advisory service and the products offered therein – thus, the client cannot be sure whether the advisor is optimizing the solution for the client's best interest or, on the contrary, towards higher fees and provisions.

Considering the clients' general preference and demand for transparency [Lechner et al. 2009], especially regarding the cost of advisory services [Mogicato et al. 2009], the revenue models of FSPs lead to a paradoxical situation; while FSPs are trying to confront competition by designing cost structures to be highly non-transparent and difficult to compare [Carlin 2009], they are at the same time impairing the resulting service quality as perceived by their clients – potentially also affecting their satisfaction. Indeed, looking at the prevailing business models of Swiss FSPs and the resulting incentive systems of advisors, we argue that the lack of cost transparency may be a major source of client dissatisfaction.

As legislative regulations trying to establish transparency "top down" do not hold up to their promises [Oehler and Kohlert 2009], in this essay we suggest a "bottom up" approach of introducing transparency at the locus of investment advisory services – the client-advisor encounter. We start our investigations by posing the question of why FSPs are still refraining from establishing cost transparency. Based on a comprehensive study of the status quo of investment advisory services in Swiss FSPs [Mogicato et al. 2009], we find two major reasons:

(1) Given that information technology (IT) is hardly used in advisory encounters [Schwabe and Nussbaumer 2009], cost transparency of advisory results (i.e., product portfolios configured by the advisor and adapted to the client's preferences) is very difficult to maintain – while it is complex enough to allow for ad-hoc changes of product allocation (e.g., replacing one product with another), it is virtually impossible to adapt and configure such portfolios while dynamically adjusting or accounting for changes in the cost structure, as the calculation of actual costs in such scenarios is too complex. Thus, the client is confronted with the actual costs of her decisions typically only after they have been made.

(2) FSPs consider cost transparency being detrimental to existing business models, supposing – and thus following neoclassical theory's intuition – that clients would always opt for the least expensive product from a

set of (perfect) substitutes (including products of competitors). The majority of FSPs find such client behavior problematic, as they – in order to provide their advisory services "free-of-charge" – have to cross-subsidize them with earnings from selling products, which in turn involve a multitude of subsidiary costs, such as management fees, transaction fees, etc. This constellation, however, exposes the client to serious conflicts of interests – will the advisor optimize the client's portfolio according to her needs and preferences or rather to achieve cost coverage?

In previous research, we have suggested that transparency issues in investment advisory encounters may be best addressed with shared IT artifacts [Nussbaumer and Schwabe 2010]. Providing shared information spaces, such artifacts may increase the client's perceived transparency in respect of the advisory process as well as the information used therein [Nussbaumer, P., Matter, I., and Schwabe, G. 2012b].

In this essay, we present a complete design science research cycle [Hevner et al. 2004], in which we demonstrate that such shared artifacts may also bridge the complexity of enabling cost transparency (ad-hoc access to cost information and dynamic calculation of costs). Such procedure is also interesting from a transparency research perspective. While much literature is concerned with the theoretical benefits and effects of transparency, empirical investigations are rare, especially in terms of design research. We aim to contribute to this body of knowledge in two ways. First, we provide insights into the feasibility of incorporating facets of cost transparency into the design of shared IT artifacts; second, in an experimental evaluation we demonstrate the efficacy of such artifacts in actually improving cost transparency as well as investigate their practical impacts on client-advisor encounters. Based on the literature on cost transparency, we argue that introducing cost-transparent artifacts may – in contrast to the FSPs' beliefs – not only have positive influence on the client's satisfaction with the encounter but also on her willingness to pay.

We addressed the feasibility of cost-transparent shared artifacts in the build cycle of our design science endeavor. In doing so, we based our solution artifact on previous design principles of establishing process and information transparency in investment advisory encounters [Nussbaumer and Matter 2011; Nussbaumer, P., Matter, I., and Schwabe, G. 2012b]. Conceptualizing cost transparency as a specific facet of information transparency, in this essay we show how we extended the design principles by features of cost information provision. We then provide insights into how the design may be

instantiated in a collaborative IT artifact mediating client-advisor interaction. To this end, we will present the prototypical software implementation of such an artifact for a multi-touch tabletop device.

We evaluated our cost transparent artifact design in experimental evaluations using this prototypical artifact as follows: as to delimit the utility and efficacy of the cost transparency design from features regarding process and information transparency, we compared the cost-transparent artifact to a similar artifact that implemented general features of process and information transparency but lacked cost transparency features [Nussbaumer, P., Matter, I., and Schwabe, G. 2012b]. For this purpose, we conducted an experimental evaluation using a within-subject design with 12 clients and 2 advisors, where client participants passed two advisory settings (treatments) supported with the respective artifacts. Differences in client valuation between the settings could therefore be ascribed to the differences of the IT artifacts, which were only related to cost transparency features.

The results of our experimental evaluation demonstrate our design's efficacy in improving the client's perceived understanding and comprehension of costs; they also show the positive influence of the artifact's cost transparency features on the client's general perception of the advisory encounter. On the one hand, clients show increased satisfaction with both the advisor and the advisory encounter in the cost-transparent setting. On the other hand, and supporting Carter and Curry's [2010] notion of an individual's economic and social perspective on product pricing, our results show that in cost-transparent settings clients indeed tend to prefer less expensive products (economic perspective) but in turn exhibit an increased willingness to pay for such encounters (social perspective). Thus, our findings may also challenge the common belief of FSPs that transparent, fee-based advisory services would neither be accepted by clients nor be economically viable.

The concept of cost transparency discussed in this essay initially emerged from a study on investment advisory encounters [Mogicato et al. 2009]; it was further developed in cooperation with à Porta [2010], in context of which the prototype system presented in this essay was implemented and evaluated. While the latter work focuses on the organizational ramifications of (cost-) transparent business models and their effects, this essay focuses on the principles of collaborative IT artifact design to enable cost transparency in client-advisor encounters. Evaluation results reported herein are based on entirely revised and extended analyses of experimental data also reported in à Porta [2010]. A shortened and adapted version of this essay was presented in Nussbaumer et al. [2012a].

This essay is organized as follows. Section 8.2 introduces some background on issues arising from investment advisory encounters lacking (cost) transparency. Sections 8.3 and 8.4 present basic design principles of enabling transparency in investment advisory encounters with collaborative IT artifacts and shows how to apply them for cost-transparent designs. In Section 8.5, we will present the prototypical implementation of such a cost-transparent collaborative artifact; it is then evaluated in Section 8.6. Evaluation findings will be discussed in Section 8.7. Finally, the essay will be concluded in Section 8.8.

8.2 Transparency in Investment Advisory Encounters

In this essay, we exemplarily investigate cost transparency in Swiss investment advisory services with a focus on affluent private clients (with an approximate investment amount of 50'000 to 500'000 CHF). We chose to investigate this segment as it marks the bottom end of the private banking market and is, given its potential growth, increasingly considered a lucrative market by FSPs [Molyneux and Omarini 2005]. Also, most Swiss FSPs have established structured advisory processes to target this growing segment with consistent and efficient services. These advisory processes provide assistance in defining strategic asset allocations according to the client's needs and risk preference as well as their tactical implementation with financial products. We base our insights on investment advisory practice on investigations of 37 Swiss financial service providers [Mogicato et al. 2009] as well as in-depth interviews and observations in a major Swiss bank.

8.2.1 Transparency Issues

In investment advisory service encounters, client-advisor interactions exhibit several characteristics that are detrimental to advisory quality. Most prominently, the encounter is inherently impacted by information asymmetry and interest asymmetry, problems that are well established in scientific literature in context of the principal-agent problem [Golec 1992]. Information asymmetry results from the client being generally less knowledgeable than the advisor – thus, she cannot be sure whether the advisor actually gathers and provides all relevant information and recommends appropriate solutions for her financial needs. The relation between client and advisor can be additionally strained by conflicts of interests. Advisors might exploit information asymmetry by, e.g., superficially gathering and providing information or, even worse,

recommending products that are unsuitable for the specific client's needs but profitable in terms of fees.

From the client's perspective, these issues may be characterized by the implied lack of transparency. For investment advisory service encounters, we may differentiate between *process transparency*, *information transparency* and *cost transparency*. Process transparency relates to "the degree of the client being able to follow and comprehend the performed activities (what constitutes an activity and why is it performed) and their succession in advisory [services]" [Nussbaumer and Matter 2011:280]. While this entails the comprehensibility of the advisory process, information transparency involves two aspects; (1) the clients' comprehension of which information are recorded and for what purpose [Awad and Krishnan 2006], as well as (2) the degree of the client being enabled to monitor and comprehend the informational basis of decision-making [Nussbaumer, P., Matter, I., and Schwabe, G. 2012b].

Regarding the recommendation of products (the ultimate goal of investment advisory services), we argue that cost transparency is highly relevant. When buying or selling financial products, the transaction costs as well as the costs associated to a specific product (including direct costs such as initial buy charges, sell charges, stamp duties and management fees as well as indirect costs like retrocessions or finder's fees) play a vital role, since these costs directly influence the portfolio's effective return. Providing the client with the exact costs of products rather than only with their exchange rates should thus allow for a more realistic assessment of product choices and their effects and better enable the clients to evaluate the advisor's recommendations.

In this essay, we conceptualize cost transparency as a facet of the discussed second aspect of information transparency, related to the client being enabled to monitor and comprehend the information base of the advisory encounter. This concept is closely related to price transparency, which is concerned with "information revealing the allocation among agents in a supply-chain of proceeds from the sale of a product or service" [Carter and Curry 2010:760]. Also acknowledging the transparency definition of Kraft [2008], we therefore may define cost transparency as *the client's perceived degree of information revelation regarding costs and their allocation*.

In investment advisory encounters, the degree of information revelation is typically low or inappropriate [Oehler and Kohlert 2009]; precise costs and prices are either not available in the encounter or not disclosed (e.g., because of interest conflicts), or may be represented in an overly complex manner

(inherent to the complex cost structures, e.g., Carlin [2009]). Thus, to establish cost information transparency, cost information (1) has to be made available in the advisory encounter and (2) be comprehensibly represented and included in decision-making.

8.2.2 Effects of Transparency

Looking at the diversity of research domains that are concerned with transparency, we find a rich body of literature on theoretical benefits and effects of transparency. Empirical investigations, however, are rare, especially regarding advisory settings. For IS research, we are not aware of theoretical, empirical or design-related accounts regarding cost transparency in investment advisory services or client-advisor encounters in general.

For their concepts of increasing the customer's involvement in service encounters, Inbar and Tractinsky [2011] propose that transparency may be increased by sharing information with IT. They suggest that establishing transparency may positively influence the client's perception of the service encounter and provider (e.g., regarding fairness and integrity, trust and satisfaction). In their empirical investigation of buyer-vendor relationships, Eggert and Helm [2003] as well conclude that transparency contributes to the overall success of a business relationship, delivers value to the customer and increases satisfaction.

Other practical implications may be drawn from the research of Andersson and Holm [1998]. They argue that decision makers who are guided by "Popperian epistemology" will have a preference for transparency – only if information is provided transparently, the individual will be able to potentially "falsify" them (analogous to Popper's postulation that scientific theories need to be falsifiable). Andersson and Holm [1998] associate such preferences with an individual's suspicion in situations where transparency is not warranted, and hypothesize that individuals are more inclined to suspect manipulation when falsification of the information at hand is more difficult.

In the behavioral finance literature, preference for transparency has been prominently discussed as a behavioral bias of investors, termed "ambiguity aversion" [Camerer and Weber 1992]. Research suggests that individuals appreciate "ambiguous" situations (having no information about the probability distribution) less than "risky" situations (the probability distribution of the event is known), and are normally willing to pay to avoid ambiguity [Stracca 2004:382]. Carter and Curry [2010] find similar evidence in their research on transparent pricing, showing that individuals prefer

products with transparent prices (providing allocation of costs to different supply-side parties) over their non-transparent counterparts and are willing to pay premium prices for such products.

8.2.3 Cost Transparency

In Switzerland, regulations on cost disclosure differ depending on the relation of client and FSP, i.e., whether the client maintains accounts and portfolios without making use of advisory services ("execution only"), taking advice but making her own decisions ("investment advice") or completely transfers decision-making to the provider ("asset management mandate") [Roth 2009]. While in all cases FSPs have to fulfill basic duties of allegiance, due diligence and information disclosure, they are obliged to provide detailed cost information (including financial recompensation) only for mandates [FINMA 2008].

For European financial markets, the European Commission [2004] passed the Markets in Financial Instruments Directive (MiFID) to establish uniform regulations with an emphasis on consumer protection. Generally focusing on principles of "best execution", the directive also demands providing all relevant cost information [European Commission 2004:Art. 19, par. 3; Roth 2007:39]. Oehler and Kohlert [2009] argue, however, that such regulatory requirements are too generic and must fail, as they are neither comprehensive nor specific enough and make unrealistic assumptions regarding the client's prior knowledge and ability to comprehend the provided information [Oehler and Kohlert 2009:98]. The Swiss Federal Banking Commission [Eidgenössische Bankenkommission 2008] makes a similar point by questioning the usefulness of comprehensive information disclosure – indeed, critical analysis of the information would have to be performed by the generally less knowledgeable client.

The clients' preference for transparency and legislature's efforts to create adequate regulations on transparency, however, seems not to be mirrored in FSP's practice of investment advisory services [Mogicato et al. 2009]. To the contrary, Carlin [2009] shows that complexity of financial products tends to increase with competition – it is, in fact, a strategy of market participants to achieve higher profits. As most clients are not aware of a product's associated costs and their influence on the portfolio's return or not be able to (dynamically) estimate them, enabling transparency is timely – Finra [2009] finds this might be a quite general issue, reporting that the majority of private investors (in the US) have problems with assessing costs and prices of financial products. Thus, the responsibility for such considerations lies

with the advisor, who may (or may not) exploit the information asymmetry for his or the FSP's self-interest.

In a comprehensive study of advisory practice in Swiss banks [Mogicato et al. 2009], we found that clients are quite aware of the discussed transparency issues, especially concerning the cost structure of advisory services and financial products; consistently, in a recent survey, Lechner et al. [2009] found that 96% of private banks are aware that clients demand increased transparency from them. However, the prevailing lack of such transparency results in clients considering financial advisors as being rather untrustworthy and being not very confident that advisors present adequate solutions to their needs [Mogicato et al. 2009; Nussbaumer et al. 2011]. Indeed – as, for example, Bergstresser et al. [2009] have shown – products recommended by advisors tend to exhibit higher costs while featuring lower risk-adjusted return than products selected by investors themselves.

The prevailing advisory business model of FSPs in Switzerland (and, incidentally, also in Germany and other European countries [Oehler and Kohlert 2009]) builds on cross-subsidizing advisory services through product and transaction costs (by direct and indirect costs, as discussed above) [Roth 2007]; while this strategy allows providing advisory services "free-of-charge", the actual costs of advice – as included in the product costs – remain non-transparent. Though such lack of transparency might negatively affect the client-advisor relationship and the client's resulting satisfaction, FSPs are still reluctant regarding alternative business models. Fee-based advice, i.e., the client being charged for utilizing advisory services, has been discussed long-since and suggested as a solution to interest asymmetries [Oehler and Kohlert 2009]. FSPs, however, have been countering such models by bringing forward that clients were accustomed to services provided free-of-charge and therefore lack willingness to pay for them – for a "first-moving" FSP, charging fees could result in competitive disadvantages [Mogicato et al. 2009].

8.2.4 Cost Transparency and Information Technology

Cost transparency might also be inhibited by the lack of appropriate tools. While, e.g., costs of individual stocks may be easily evaluated according to up-to-date printouts of the according fact sheets, such assessments tend to get more complex for composite products such as mutual funds, featuring multiple cost types. When including the dynamic allocation of several products while accounting and optimizing for product and overall portfolio costs (including means of comparing different options and presenting their

effects for the client's specific portfolio), the use of pen and paper is clearly limited.

While the typical Swiss FSP provides the advisor with powerful tools to prepare client encounters and perform follow-up activities, IT support for advisor-client encounters is hardly found. For Swiss advisory practice, Schwabe and Nussbaumer [2009] found that none of the 37 surveyed FSPs provided their advisors with dedicated tools to be used directly with clients. The provided IT's focus on supporting activities outside the actual client encounter is also reflected in standard software – most products lack of dedicated in-meeting support other than rotating the monitor screen to let the client behold of visualizations. Such setups of ad-hoc inclusion of IT may not only expatiate on the information asymmetry between the actors but may also increase the inexperienced client's uncertainty as the visualizations are mostly intended for experts (i.e., the advisor) [Inbar and Tractinsky 2011].

Likewise, research on IT support of financial advisory services (of which investment advisory services are a subset of) often shows an implicit focus on supporting the *advisor* in preparing client solutions [Buhl et al. 2007; Eberhardt and Zimmermann 2007; Winkler 2006; Dziarstek et al. 2004]. The use of such systems may in fact restrict the advisor in respect to opportunism (e.g., recommending products not suitable for the client but attractive to the advisors in terms of provisions). However, these systems are designed to be used solely by the advisor outside the encounter, i.e., before or after the advisory session. As the client cannot actually monitor the advisor's interaction with the information systems, they do not directly contribute to enhanced transparency for the client, e.g., in respect of advisory activities, the used information and its effects. We find this advisor-centricity to be in stark contrast to related domains of sales-based advisory services such as travel consultancy, where there has been some research effort regarding in-situ IT support for joint decision-making of advisor and client [Halloran 2002; Rodden et al. 2003; Novak and Schwabe 2009].

8.3 Transparent Design of Investment Advisory Encounters

We suggest that the problem areas of investment advisory services (low comprehensibility and low perceived quality because of information and interest asymmetries) may be attributed to inherent transparency issues regarding the activities of the advisory process (process transparency), the information used therein and their impacts (information transparency) and, as a facet of such information, costs of the service and its products (cost transparency). In previous design cycles, we have already developed and

refined several design requirements for collaborative IT support to enable process and information transparency. Thus, we will base our considerations of cost transparency design on the main principles of such IT support [Nussbaumer, P., Matter, I., and Schwabe, G. 2012b]. We will briefly present these principles and their basic rationales below.

The most fundamental design principle (DP) relates to information sharing between the client and the advisor (*DP1: Provide shared information spaces for advisor and client in order to allow information access and monitoring of actions*) and represents the bottom line of enabling IT-mediated client-advisor interaction. Thereby, the client and advisor should be provided shared "informational resources" that both can refer to and make sense of [Rodden et al. 2003]. As such, the client should be activated to participate and take more responsibility in the process, e.g., by enabling her to (maybe autonomously) adapt or change suggestions or recommendations of the advisor.

To enable transparency in investment advisory encounters, the provision of shared information spaces is necessary but not sufficient. To cooperate (and co-create) with the advisor, the client has to understand and comprehend the means and ends, i.e., the advisor's activities and their goals (*DP2: Enable client comprehension of advisory activities and their goals in order to provide process transparency*), e.g., how their initial inputs (needs, preferences, financial situation) are related to the final advice (e.g., product portfolio). The shared artifact therefore should visualize the activities so the client may comprehend intermediate results as well as the final solution to her investment problem.

In traditional pen and paper encounters, advisors may not have complete information (e.g., fact sheets of all relevant products) or the latest information at hand (e.g., product performances). A supportive artifact therefore should enable access to all relevant information with the help of integrated information sources (*DP3: Support client-advisor interaction with adequate information in order to provide information transparency*). Furthermore, to address the client's comprehension of information use, visualizations of relevant information should be provided as to give feedback regarding their purpose and possible effects.

Clients may find it difficult to relate abstract concepts (such as risk and return of investment strategies) to practical impacts regarding their financial situation. Thus, the artifact should allow for relating the relevant concepts to each other and allow comparing different options (*DP4: Provide means of comparison in order to enhance comprehension of the process and its*

information). For example, the client should be enabled to compare the effects of her optimized investment strategy with her current situation, including the risk-return tradeoffs. This principle adds a further dimension to providing process transparency (reflecting the implicit solution strategy of advisory activities, i.e., optimization by comparison) and information transparency (visualizing effects of provided or adapted information by comparing their outcomes).

Finally, the provided shared information spaces should not restrict clients and advisors in performing their favored structuring and enactment of the encounter processes, i.e., not imply standardized step-by-step processes but allow for adaptations of the advisory process flow according to the specific tasks (*DP5: Allow actors to customize the advisory course*).

So far, we have been able to apply and refine these design principles in three consecutive design cycles, investigating designs and effects of process and information transparency [Nussbaumer and Matter 2011; Nussbaumer, P., Matter, I., and Schwabe, G. 2012b]. We found advisory encounters provided with shared, transparent IT support to be superior compared to their pen and paper counterparts; IT support implementing the specified design principles relates to significantly improved process and information transparency as perceived by the client and significantly increased trustworthiness and client satisfaction [Nussbaumer, P., Matter, I., and Schwabe, G. 2012b].

8.4 Designing for Cost Transparency

We have argued above that issues related to cost transparency may also be a result of a lack of appropriate IT support in client encounters. With the typical product horizon of a FSP, paper-based access to relevant product-related cost information as well as the dynamic calculation of aggregated costs might be too complex or time-consuming, therefore implying support with IT artifacts. To investigate our conceptualization of cost transparency, we initiated a design cycle based on the design principles presented in the previous section. We sought to design an IT artifact that follows the objective of addressing the two main requirements of cost transparency, i.e., (1) providing transparent cost information access and (2) comprehensibly represent and include such information in the advisory situation. Relating to the proposed effects of such transparency in the literature, such an artifact should positively influence the client-advisor interaction and improve the client's perception thereof.

While previous artifacts [Nussbaumer and Matter 2011; Nussbaumer, P., Matter, I., and Schwabe, G. 2012b] focused on supporting advisory activities

to define (strategic) investment strategies, the usage scenario of our cost transparency design cycle entailed the collaborative construction of (tactical) product portfolios according to a previously defined investment strategy. The goal was to allow the client and advisor to browse through available products, evaluate and compare them and jointly decide on which products to add to the client's portfolio.

Since the comprehensive inclusion of all financial products potentially available to a FSP client was not feasible for the purpose of prototyping, we simplified the artifact's usage scenario and corresponding design to allow the composition and adaptation of product portfolios consisting only of mutual funds. Due to their rather uniform cost structure (initial charges, sell charges, stamp duties and management fees) and public availability of cost information, they also allowed for realistic implementation and evaluation of the artifact. In the following, we will re-examine the previous design principles from the perspective of cost transparency.

To establish informational common ground and joint interaction, providing shared information spaces for advisor and client (DP1) is a prerequisite. While general transparency (e.g., regarding the process and activities) does not necessarily imply a technological imperative, we suggest that the complexity of dynamic provision of cost information requires this principle to be implemented using IT support. As such, cost transparency requires incorporation of DP1 in a technological shape to allow provision of dynamic cost information as well as to make them jointly available to advisor and client. This means that the client should not only be informed of actual costs but also be "activated" and enabled to act on the provided information, i.e., to incorporate costs in compiling her product portfolio.

DP2 requires the transparent artifact to make advisory activities and their goals comprehensible. Such process transparency seeks to enable the client to comprehend the rationales that underlie the advisor's activities, such as choices in product selection. In respect of cost transparency, this principle has the extended goal of enabling the client to also comprehend the advisor's rationales regarding product costs. Providing means of advisor monitoring through shared information spaces is a prerequisite of clients to comprehend the advisor's actions also regarding their implications on costs.

Thus, to enable the client to transparently assess the financial impacts of decisions (e.g., buying or selling specific products), she must be enabled to monitor the specific costs of the emerging solution. DP3 generally seeks to transparently provide the client with the advisor's informational basis (e.g., presenting internal information of the FSP as well as client information) and

the influence and effects of this information on the advisory process and its result. As such, the principle emphasizes on the implied increase of client comprehension, e.g., when providing information material on the mechanics of asset classes or interactively showing the influence of the client's marital status on her tax burden. Thus, providing transparent cost information may facilitate client learning of cost structures of products in different asset classes. However, interactively presenting product cost effects (e.g., on total costs or net portfolio return) also effectively addresses one of the main problems of advisory services, i.e., the potential opportunism of advisors. Being provided with shared information spaces, the client is not only enabled to monitor the advisor's action but also to *evaluate* them in terms of costs, restricting the advisor in, e.g., opportunistically recommending profitable but unsuitable products. Above, we have defined the provision of cost information as a special facet of information transparency – including cost information, however, extends the goal of DP3 of information provision for increased client comprehension towards client empowerment to evaluate (and thus "falsify") the advisor's recommendations.

Putting an emphasis on the "falsification" of advisor actions and recommendations also affects DP4. In respect to process transparency and general information transparency, means of comparison allow the client to better comprehend the advisor's actions and their rationale. For example, comparison of the projected risk and return performance of the current investment strategy with the projected performance of the recommended optimization provides the client with a general indication of *potential* effects. In contrast, cost transparency should allow comparison of recommendations' *definite* effects by providing detailed cost information of individual products and aggregated costs for created portfolios.

In respect of process adaptability required by DP5, introducing cost transparency should not interfere with the course of the advisory encounter. Transparency of costs should be enabled in a way that allows the client to monitor contextual cost information at any time and independent from advisory activities.

8.5 Prototypical Implementation

Analogous to previous design cycles [Nussbaumer, P., Matter, I., and Schwabe, G. 2012b], we instantiated the design principles discussed in the previous section in a software application for the Microsoft Surface tabletop device, supporting the interaction scenario depicted in Figure 8-1. While providing a shared application constitutes the basis of fulfilling the artifact's

first objective – providing access to cost information –, the particular design of how to provide such access in an understandable and comprehensible way, as demanded by the second objective, is important. In the following, we will therefore provide some details on the design implementation along the underlying design principles.

We designed the basic interaction of the artifact to allow collaborative creation of a product portfolio according to a specific (previously defined) investment strategy. To this end, client and advisor are provided with a shared information space (DP1) that mediates their encounter and allows both actors to interact on common ground and monitor each other's actions.

The application's basic information space (Figure 8-2) is divided into the advisor's solution space (products; Figure 8-2, B) and the client's problem space (product portfolio with cost information; Figure 8-2, C) as well as a "transition space" for evaluating and comparing specific products (Figure 8-2, A) before adding them to the client portfolio. Generally, both the client and the advisor may interact with all application spaces via touch interaction; as he is both the domain and the tool expert, however, it is assumed that the advisor is the application's primary user and leads the client through the course of portfolio construction. Still, the shared information space allows the client to monitor the advisor's actions and take corrective action at any time (DP1, DP2).

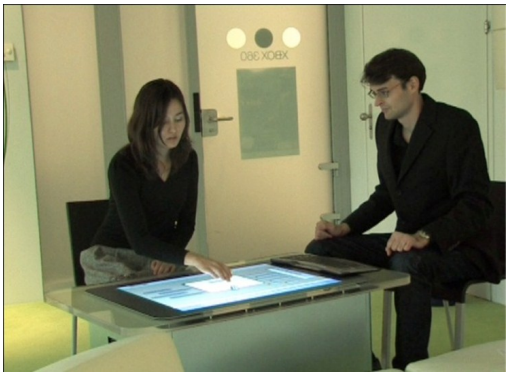


Figure 8-1: Collaborative client-advisor interaction, mediated by Microsoft Surface[24] tabletop

The application allows constructing individual portfolios by adding and removing products (mutual funds) according to different asset classes

[24] http://www.microsoft.com/surface

(shares, bonds and real estate; Figure 8-2, B). When selecting an asset class, the associated products are presented in the "transition space" as cards that may be freely arranged and oriented (Figure 8-2, A). The cards are used to compare products (DP4) based on several information dimensions (see below). Once a product is selected, it is listed in the client's product portfolio (Figure 8-2, C) along with the portfolio's total costs. Thereby, the costs of all products in the portfolio are summed up and categorized into one-time and recurring costs. This allows showing effects of adding and removing products from the portfolio, enabling the client to better comprehend and understand the consequences of such changes (DP3). As for the client to see relevant portfolio cost information and include them into her decision making, the portfolio's cost information is visible at any time.

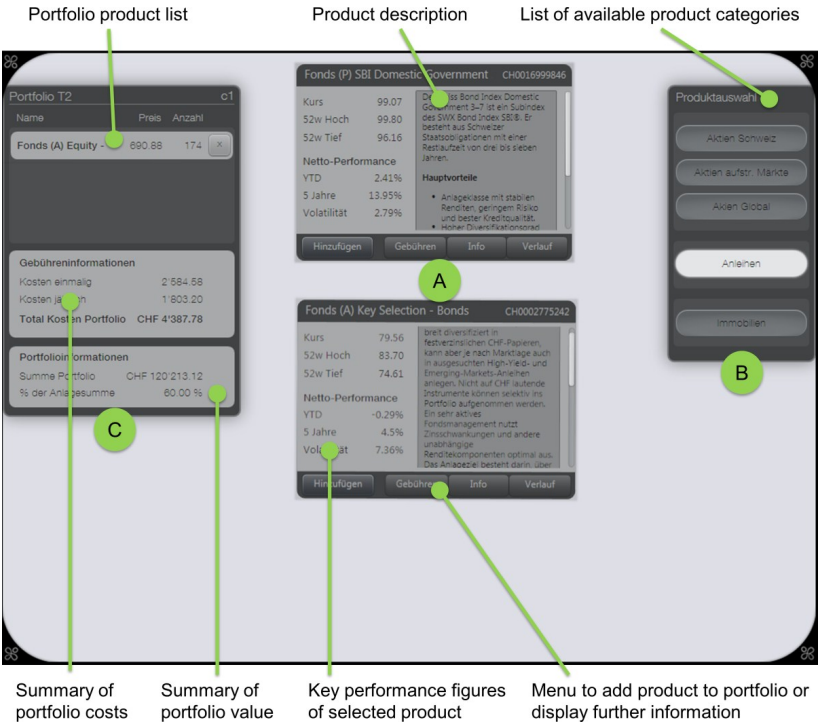


Figure 8-2: Overview of the prototype application – (A) product "cards" to compare different products, (B) selection of products, (C) current product portfolio

As already indicated above, all available products of the different asset classes are displayed as cards (Figure 8-2, A) that feature several information

categories. To satisfy the general requirement of information transparency (DP3), each product card includes a short description and basic information about the exchange rates and net performance (Figure 8-3, II) as well as performance graphs (Figure 8-3, I). This information should support the client and advisor in evaluating the products' appropriateness for the client's portfolio, e.g., in regard to risk and return.

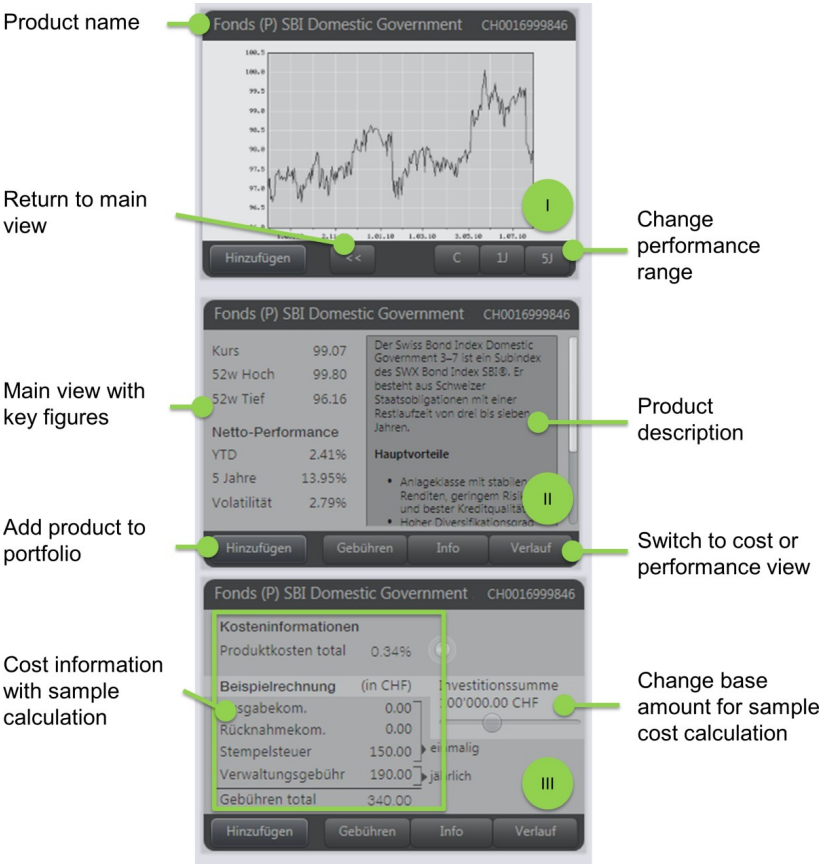


Figure 8-3: Information provided by product cards - (I) performance view, (II) main view: general information (product description, figures on exchange rate and net performance) (III) cost structure

Cost information is made available on a separate card tab (Figure 8-3, III), displaying the cost structure of the product with all relevant partial and aggregated costs (initial buy charges, sell charges, stamp duties and

management fees). Furthermore, the tab allows partial and total costs of a product to be calculated for a specific (adaptable) investment amount. Such calculation of effective product costs allows quick comparison (DP3) of products independent from the actual portfolio, i.e., without adding and removing products and changing the portfolio. To evaluate their actual influence on the total portfolio costs, however, the users may also easily add and remove products to and from the portfolio. Thereby, the client should be enabled to better assess the cost factors of different financial products and their differences, also stimulating her to discuss potential ambiguities with her advisor or "falsify" his recommendations.

Our prototype design incorporates relevant cost information as contextual information that is attached to the advisory encounter's main objects of interest, i.e., the products and the portfolio. While the current summary of portfolio costs is visible at any time, information on product costs on the respective cards has to be actively selected – it is in the actors' discretion to investigate and discuss the information or not. As such, the integrated cost information does not require additional advisory activities or a particular order of activities (DP5).

8.6 Experimental Evaluation

In the previous sections, we have presented the *build* activities of our design cycle. We re-examined general design principles for client-advisor interaction to also account for cost transparency and demonstrated the feasibility of implementing them in a software artifact.

Regarding the *evaluate* activity of design science endeavors, there is agreement among researchers that design science artifacts have to be rigorously evaluated by appropriate methods [Hevner et al. 2004; March and Smith 1995; Witte 1997] to demonstrate their utility, quality, and efficacy [Hevner et al. 2004:16]. Thereby, the artifact's performance should be evaluated against its design goals and objectives rather than only its specific (technological) features [Hevner et al. 2004:78; Peffers et al. 2007:56; March and Smith 1995:254].

Several methods have been proposed such evaluation of design artifacts, including observational (case or field) studies, action research, surveys, analytical analyses, functional or structural testing, descriptive argumentation and experimental techniques such as controlled experiments or simulation [Hevner et al. 2004:18; Cleven et al. 2009:4; Riege et al. 2009; Siau and Rossi 2011]. To validate design artifacts against conjectures about the outcome the designer sought to improve, experimental techniques like

controlled experiments are useful; these allow measuring the degree to which the design objectives have been achieved [Briggs and Schwabe 2011]. In this context, conjectures contrast the value of some dependent variable (e.g., satisfaction) across treatments that instantiate differing values of an independent variable. In design science research, one treatment often relates to using the designed artifact, whereas other treatments may include previously designed technological artifacts or control conditions featuring no technological artifact [Briggs and Schwabe 2011:7].

We designed and implemented our software artifact along the design objective of enabling cost transparency in financial advisory encounters and according to conjectures regarding the positive effects of such transparency suggested by the literature. Experimental techniques provide appropriate means to evaluate the artifact and the associated conjectures of its efficacy and effects in a controlled environment. The experimental setting allowed us to simulate advisory encounters comparably well, as we could build scenarios that mirrored actual encounters between clients and advisors, including realistic tasks and their duration. By additionally employing actual investment advisors, we could evaluate the artifact in a quasi-natural but controllable environment.

To be able to delimit the specific utility and efficacy of our cost-transparent instantiation from the general features of process and information transparency, we built our experiment upon two different settings (treatments). Thereby, one treatment related to using the artifact that instantiated cost transparency, whereas the second treatment related to an analogous software artifact that only instantiated the general principles of information and process transparency. Differences in client valuation between the settings could therefore be ascribed to the differences of the IT artifacts, which were only related to cost transparency features.

8.6.1 Conjectures

The presented artifact was developed along the design objective of improving cost transparency in client-advisor encounters. The most basic conjecture of our evaluation relates to the artifact's fulfillment of this objective. As the designed artifact makes available all relevant cost information, it may be objectively referred to as being cost-transparent. Along our definition of cost transparency as the "client's perceived degree of information revelation regarding costs and their allocation", we assume that the designed artifact will also improve the clients' subjective perception of

cost transparency, i.e., improve her understanding and perceived comprehensibility of cost information:

C0: Clients advised with an IT artifact implementing cost transparency features will show improved understanding and perceived comprehensibility of product costs than clients advised with an IT artifact not implementing cost transparency features.

Based on the discussion of proposed transparency effects in the literature (Section 8.2.2), we may also state some conjectures regarding the expected influence of the cost-transparent artifact design. Literature suggests that individuals will prefer transparent alternatives [Camerer and Weber 1992; Andersson and Holm 1998]. Furthermore, in our exploratory research we found that clients often ascribe their discontent with advisory services to a lack of transparency [Mogicato et al. 2009]; by implication, we assume that clients will prefer cost transparent advice over its non-transparent counterpart, and – along Eggert and Helm's [2003] observation that (relationship) transparency might increase client satisfaction – find both the encounter as well as the advisor more satisfying. The according conjectures read as follows:

C1.1: Clients advised with an IT artifact implementing cost transparency features will show higher satisfaction regarding the advisory encounter than clients advised with an IT artifact not implementing cost transparency features.

C1.2: Clients advised with an IT artifact implementing cost transparency features will show higher satisfaction regarding the advisor than clients advised with an IT artifact not implementing these cost transparency features.

FSPs are not very eager to provide cost transparent advisory services because of their implied effects on existing business models. Research on price transparency [Carter and Curry 2010], however, suggests that clients not only prefer transparent settings but may also be willing to pay premium prices compared to non-transparent scenarios. We therefore assume that clients will show higher willingness to pay for cost-transparent advisory settings:

C2: Clients advised with an IT artifact implementing cost transparency features will show higher willingness to pay for the advisory service than clients advised with an IT artifact not implementing cost transparency features.

8.6.2 Method

Participants. Our evaluation involved 12 clients and 2 advisors from a medium-size Swiss bank. We determined the sample size by applying power analysis as suggested in the literature [Baroudi and Orlikowski 1989; O'Keefe 2007]. We calculated the sample size of 12 client participants using G*Power 3 [Faul et al. 2007] according to an assumed large effect size of d_z = 0.9 (with an assumed mean difference and standard deviation of 1 and correlation of 0.4), an error probability (α) of .05 and a test power (1-β) of .80.

As getting access to FSPs' affluent clients proved prohibitively difficult because of confidentiality issues, we chose to acquire the client participants by recruiting them from a university forum (offering 20 CHF as compensation for a test duration of approximately one hour). Such convenience sampling, where participants partake in studies based on self-selection, is one of the most common sampling techniques [Lunsford and Lunsford 1995; Trochim 2006]. As opposed to random sampling, using convenience sampling does not provide all members of a target population an equal chance of being selected; thus, the participants may per se not be assumed to fully represent the target population. This may result in low external validity of a study. For our evaluation purposes – based on findings and propositions in the literature [Andersson and Holm 1998; Eggert and Helm 2003] – we argue that preference for transparency is a general feature of (ambiguity-averse) individuals and, thus, recruiting participants by convenience sampling should not excessively constrain (external) validity.

The recruited participants (9 of them being students) were between 21 and 48 years of age, 5 of them being female, 7 being male. All of them reported high proficiency in computer use (4 participants categorized themselves as being professional users, 8 as advanced users); only 5 of them indicated that they were experienced with mutual funds.

Procedure. The test procedure consisted of two subtests. One test involved the usage of the prototype application presented in Section 8.5, providing all relevant cost information features (setting T1). The benchmark test (setting T0) involved a similar application, instantiating the basic design principles discussed in Section 8.4 and implementing the same GUI and interaction design as the artifact in T1, but not providing cost information features and associated functionalities: all cost information as shown in Figure 8-2 (C) and Figure 8-3 (III) were removed.

For both treatments, the clients and advisors received the task of compiling product portfolios of mutual funds with the prototype application (see below). The client participants passed through both settings, each being limited to 20min. After their trials, the client participants completed a quantitative questionnaire and were then asked to give feedback on their impressions.

To effectively counterbalance potential biases in respect of the succession of treatments, we randomized the order of experimental conditions [Lazar et al. 2010:50–51]. Thus, we randomly assigned one half of the client participants to the sequence T0T1 and the other half to the sequence T1T0. Thereby, they were also randomly assigned to a specific combination of advisor and setting (e.g., each client starting with "advisor 1 – T0" would afterwards be exposed to "advisor 2 – T1" and vice versa). Differences in client valuation between the encounters could therefore be ascribed, ceteris paribus, to the manipulation of the artifact's provision of cost information features.

On arrival, client participants received a short introduction (10min), including instructions about their task and financial profile. To allow for comparison and prevent participants from disclosing their actual financial situation, clients received key figures of a fictional financial background (Table 8-1).

Table 8-1: Client Profile

Investment sum	CHF 200'000
Investment horizon	10 years
Investment goal	Achieve returns that are as high as possible
Risk preference	Aggressive (on a 5-point scale "cautious – conservative – moderate – pro-active – aggressive")
Risk ability	Increased (on a 5-point scale "low – limited – normal – increased – high")
Asset allocation	60% shares; 25% bonds; 15% real estate

They were requested to perform their tasks according to these figures. Furthermore, they were advised that the sessions would "differ regarding the available information". In the sessions, the client's main task was to create a product portfolio of three mutual funds (one per asset class), matching the given asset allocation and achieving high returns. For each asset class, the client could choose between two funds that featured similar investment objectives, one being actively managed (and therefore more costly), and the other being passively managed. To establish realistic conditions, we based all information of the available products (12 in total) on existent mutual

funds, whereas we altered their names to avoid experienced clients recognizing them.

To achieve variation in client product choice and minimize learning effects between the settings, we implemented the following alterations between the settings: for asset class "shares", the client participants had to decide on one of three categories (Swiss market, global market, and emerging markets) before each session, whereas for each setting they had to choose a different category. For asset class "bonds" the actively managed product and for "real estate" the passively managed product was changed between the settings.

The two participating financial advisors were briefed regarding the client profiles (information listed in Table 8-1) and the use of the software artifact. Their main task was to support ("advise") the clients in choosing appropriate products according to their profile. The advisor's goal for each session was to "satisfy" the client so she would recommend the encounter to others. Each advisor performed six advisory sessions in setting T0 as well as six in T1. For the different settings, the advisors were given the following additional tasks:

- T0: avoid discussions about costs, try to sell actively managed products
- T1: ensure that cost information is comprehensible for the client (making her aware that costs reduce overall returns)

Apparatus. Both treatments of our evaluation were conducted using the Microsoft Surface 1.0 tabletop system (see also Figure 8-1). Thereby, each setting was supported with a dedicated tabletop system running the respective prototype application (providing cost information features / not providing cost information features).

Design and Analysis. The experimental evaluation followed a within-subjects design with the prototype version (providing cost information features / not providing cost information features) as the main experimental factor. We opted for this experimental design as it provides a more effective isolation of individual differences of the participants from the main effects. Compared to between-subject designs they are also considered more powerful, while requiring smaller sample size [Lazar et al. 2010:55–51].

The quantitative client questionnaire included measurements to test our main conjectures and client preferences (see below) as well demographic items (age, gender, job/education, advisory experience, IT skills). In addition to the quantitative questionnaire, we also asked the client participants to give

feedback on their impressions (differences, preferences) of the two settings as well as their experience regarding the sessions' IT support.

As suggested above, providing cost information through transparent shared information spaces already fulfilled the artifact's first objective of making cost information accessible. To investigate the artifact's efficacy in fulfilling the second objective – providing such access in an understandable and comprehensible way (Conjecture 0) –, however, the artifact's utility in improving the clients' cost-related perception had to be considered. We surveyed the clients' perception of cost transparency using three Likert items. Thereby, the clients were asked to assess the different settings' influence on (1) their subjective understanding of the product structure ("I understand the cost structure of the selected products."), (2) their awareness of the actual product costs ("I am aware of what the selected products cost.") as well as (3) their perceived comprehensibility of the provided cost information ("I found the cost information comprehensible.").

To measure satisfaction with each advisory session (Conjecture 1.1), we used items from the Yield Shift Theory of Satisfaction [Briggs et al. 2008]. The client's overall satisfaction with the advisors of the two sessions (Conjecture 1.2) was operationalized with a single item ("Overall, I was satisfied with the advisor."). All constructs were measured using as seven-point Likert items (ranging from 1 = "I strongly disagree" to 7 = "I strongly agree"). The participants' willingness to pay for each performed advisory session (Conjecture 2) was prompted with the following item: "How much of your investment amount of CHF 200'000 would you be willing to pay for the received advisory service?".

To investigate client preferences, the questionnaire also included conjoint measures. We conducted a rank-ordering conjoint-analysis on how the participants would trade-off the following aspects: (1) costs of advisory ("advisory session is free of charge" vs. "advisory service costs CHF 250 per hour"); (2) advisor's interests ("advisor adheres to his own interests" vs. "advisor adheres to the client's interests); (3) transparency of product costs ("product costs are not communicated" vs. "product costs are communicated"). The participant's valuation of these aspects was tested using a complete factorial plan (2 x 2 x 2 = 8 different alternatives), where the participants were requested to sort the given alternatives according to their perceived utility (attributing "1" to the advisory alternative having the greatest perceived utility and "8" to the advisory alternative with the smallest perceived utility).

We analyzed the collected data as follows. To test our conjectures, we compared the ratings of the two treatments with dependent t-tests[25] (two-tailed) for normally distributed differences. All but two differences between the dependent scores proved to follow normal distribution (Shapiro-Wilk, $p > .081$ for all differences). For items with non-normally distributed differences – "willingness to pay" (Shapiro-Wilk, $p < .001$) and "awareness of product costs" (Shapiro-Wilk, $p = .02$) – we applied Wilcoxon matched-pairs signed-ranks tests.

All p-values of the statistical tests were corrected for multiple comparisons using the Benjamini-Hochberg procedure [Benjamini and Hochberg 1995]. The correction also accounted for non-significant results. To provide an objective measure of importance, we also calculated effect sizes for all statistical significant findings (Cohen's d for dependent t-tests, r for Wilcoxon tests). To eliminate the alternative explanation that higher ratings were related to one advisor generally outperforming the other, we additionally evaluated the overall satisfaction of the participants with the two advisors. Since the ratings for the different advisors were not normally distributed (Shapiro-Wilk), we conducted a Wilcoxon test to investigate the differences. The rank-ordering conjoint-analysis was performed using the respective feature of SPSS 19.

In addition to the quantitative questionnaire, all client participants were debriefed in semi-structured interviews that incorporated four questions, regarding (a) the perceived differences between the settings, (b) which setting they would recommend to others, (c) whether they asked the advisor about costs and why (not), and (d) their general experience regarding the provided IT support. The debriefings were audio-taped, transcribed and their answers summarized. Similar to the method of thematic coding [Flick 2007:402], we analyzed the single participants' answers for thematic structures and compared and aggregated the emerging topics for all interviews.

8.6.3 Results

We present the results of our evaluation along our conjectures regarding the clients perceived cost transparency, satisfaction and willingness to pay. We then provide results of the conjoint analysis and figures on differences in the total costs of the portfolios composed in the different advisory settings.

[25] We thus implicitly assume that the responses to the Likert items can be treated interval. Non-parametric tests lead to the same results.

Perceived cost transparency. In our design considerations we assumed that making available cost information through the shared artifact should increase cost transparency. Indeed, in the evaluation client participants found that the costs of their selected products were more understandable in the cost-transparent setting T1 (Figure 8-4; $M = 6.00$, $SD = 0.85$) compared to setting T0 which excluded all cost information features ($M = 2.83$, $SD = 1.75$). Results of a two-sided dependent t-test shows this difference to be significant with large effect size ($t(11) = -5.162$, $p = .001$, $d = 2.44$).

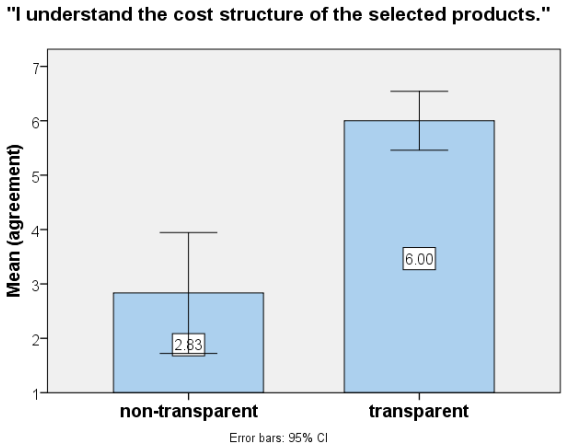


Figure 8-4: Perceived understanding of cost structure

Also, the participants' agreement of being aware of the selected products' costs (Figure 8-5; T0: $M = 2.58$, $SD = 1.98$; T1: $M = 6.50$, $SD = 0.67$) was significantly higher for the cost-transparent situation with large effect size, as confirmed by the Wilcoxon matched-pairs signed-ranks test ($Z = -2.865$, $p = .008$, $r = -.58$).

Regarding the artifact design's efficacy in providing cost transparency in an understandable manner, we also measured the client's perception of the provided information's comprehensibility. Supporting our conjecture, results show that client participants found cost information provision very comprehensible for the cost-transparent situation (Figure 8-6; T0: $M = 2.42$, $SD = 1.83$; T1: $M = 6.00$, $SD = 0.95$), showing a significant difference compared to the non-transparent setting with large effect size ($t(11) = -5.555$, $p = .001$, $d = 2.58$).

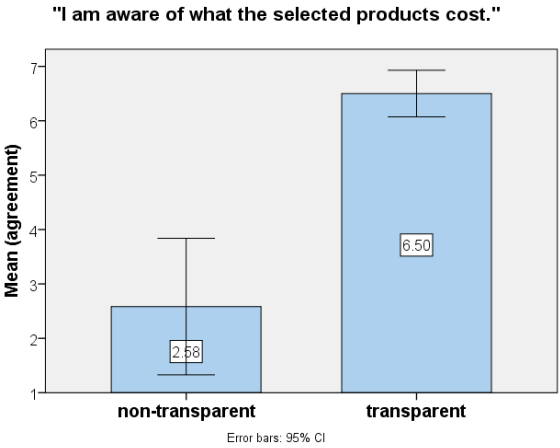


Figure 8-5: Perceived understanding of actual product costs

To gain qualitative argumentation from the participants, we also asked them for feedback on their experience. Observing the sessions, we found that only three of six participants passing the sessions in the sequence T1T0 asked about costs in T0 (featuring no cost information).

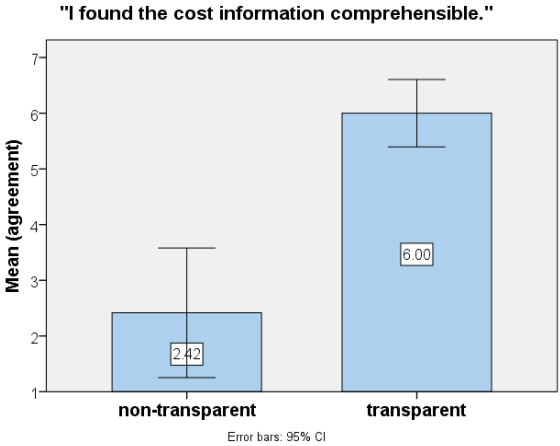


Figure 8-6: Perceived comprehensibility of cost information

In their feedback, however, those who had asked for cost information voiced their dissatisfaction with the advisors' answers. They criticized that the advisor just "read out some numbers from a sheet of paper", which was

insufficient for them to make a decision. Two of the three participants, who did not ask about the costs in T0, said that they – after having already experienced T1 – felt confident of being able to estimate the costs themselves. Interestingly, most of the participants passing the sessions in the sequence T0T1 mentioned that they had not realized that the advisor of T0 had kept back cost information until they passed T1.

Satisfaction. Satisfaction with the advisory session (Figure 8-7; T0: M = 4.60, SD = 1.39; T1: M = 5.98, SD = 0.79) as well as the overall satisfaction with the advisor (Figure 8-8; T0: M = 4.58, SD = 1.62; T1: M = 6.00, SD = 0.74) were rated lower for T0 (non-transparent regarding costs) than for T1 (cost-transparent). The results of the two-sided dependent t-test indicate significant differences for both satisfaction regarding the session ($t(11) = -3.718$, $p = .009$, $d = 1.26$) and the overall satisfaction with the session's advisor ($t(11) = -3.559$, $p = .007$, $d = 1.20$) with large effects. Hence, according to our data we may maintain conjecture C1.1 and C1.2. To eliminate the alternative explanation that higher satisfaction ratings might be related to one advisor generally outperforming the other, we sorted the participant's satisfaction ratings by advisor (advisor 1: M = 5.75, SD = 1.14; advisor 2: M = 4.83, SD = 1.59). A Wilcoxon test did not show any significant differences between the advisor ratings, i.e., one advisor did not significantly outperform the other.

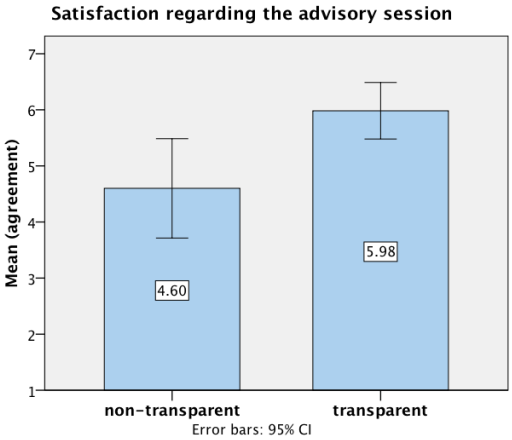


Figure 8-7: Mean satisfaction regarding advisory session

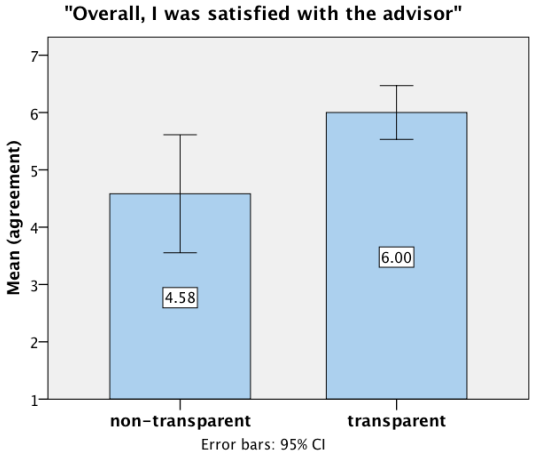


Figure 8-8: Mean satisfaction regarding advisor

In their feedbacks, all twelve participants indicated that they would clearly recommend the advisory session featuring all relevant cost information (T1). The specific explanations of their recommendation, however, were different. Four participants preferred T1 because they felt "better informed". Two felt that T1 was "more transparent" than T0. One participant mentioned that, while in T0 the advisor "was beating around the bush", session T1 better enabled advisor and client to "talk about facts". Four clients based their recommendation on the perception that the advisor in T1 was more competent.

Willingness to pay. Figure 8-9 shows the means of the participants' willingness to pay for T0 and T1. While the average willingness to pay for T0 was CHF 503, the participants were willing to pay CHF 1'485 for T1. The large standard deviation of T1 (T0: *SD* = 616.13; T1: *SD* = 2'766.76) is salient, but can be explained by the large variations (the differences between T0 and T1 ranged from CHF 0 to CHF 8'000).

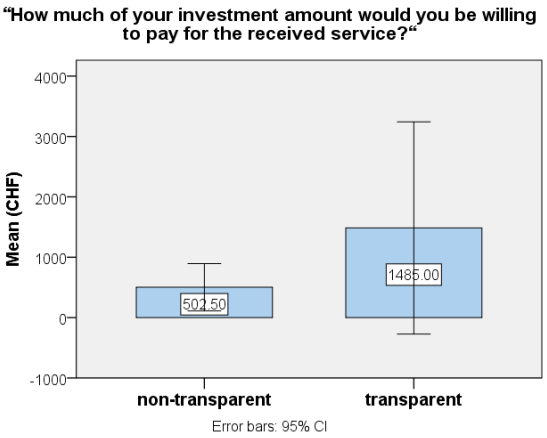


Figure 8-9: Willingness to pay

If we exclude one outlier (difference between the two answers: CHF 8'000), the differences between T0 and T1 (Figure 8-10, T0: M = 366.36, SD = 415.87; T1: M = 710.91, SD = 714.71) are significant (Z = -2.371, p = .020, r = -.48) with a large effect size. We therefore also may maintain conjecture C2.

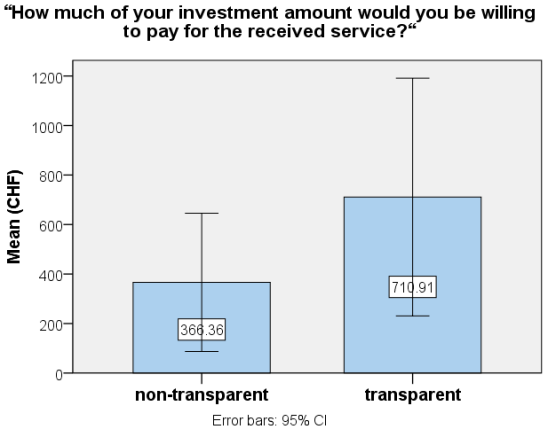


Figure 8-10: Willingness to pay without outlier

Conjoint analysis. The rank-ordering conjoint analysis (see Figure 8-11) shows that the participants value the advisor's interest the most (49%). Valued with 27.6%, also cost transparency seems to be more important for

the participants than the advisory service being free-of-charge (23.4%). Utilities of the different aspects are depicted in Table 8-2.

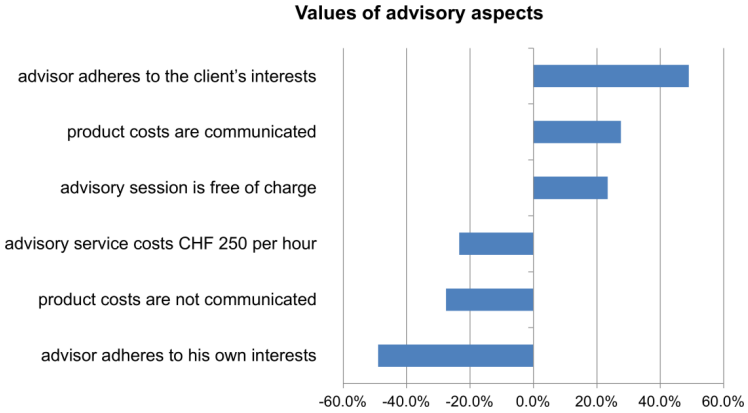


Figure 8-11: Importance of advisory aspects as valued by the participants

Though the sample size of the rank-ordering conjoint-analysis is too small to allow for general assumptions about the value systems of FSP clients, it provides interesting insights about how the participants trade off the different aspects.

Table 8-2: Utilities of advisory aspects

Aspect		*Utility Estimate*	*Std. Error*
Interests	advisor adheres to his own interests	- 1.687	0.085
	advisor adheres to the client's interests	1.687	0.085
Transparency	product costs are not communicated	-0.958	0.085
	product costs are communicated	0.958	0.085
Cost	free of charge	0.813	0.085
	250 CHF per hour	-0.813	0.085
(Constant)		2.500	0.085

For each advisory session the assembled portfolio was saved. Analyzing these portfolios, we find that for T0 63.9% of the chosen products were actively managed (and therefore more costly), whereas for T1 only 27.8% of the chosen products were actively managed (difference between T0 and T1: -36.1%). Only considering portfolios of clients inexperienced with mutual funds, the amount of actively managed products decreases by -52% – for

experienced clients, however, we only find a difference of -13%. Accordingly, the calculated portfolio costs per year (including issuing commission and redemption commission; Figure 8-12) are higher for T0 (T0: M = 6395.25, SD = 2839.56) than for T1 (T1: M = 3577.58, SD = 2355.79). A two-sided dependent t-test indicated that this difference is significant ($t(11) = 2.946$, $p = .017$, $d = 1.08$) with a large effect size.

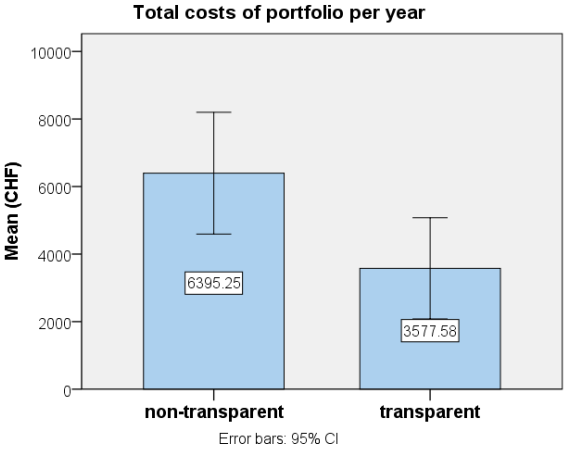


Figure 8-12: Total costs of selected portfolios (Swiss francs per year)

The participants' feedback on the IT support was mainly positive, with only two participants stating that they disliked the tool. One of them regarded himself as "old-fashioned" and would have preferred a paper-based advisory service. The other criticized the low resolution of the tabletop device and thus also would have preferred a paper-based or PC-based advisory encounter. The remaining ten participants, however, showed a very positive attitude toward the provided IT support. One participant described the advisory encounter as being very goal-oriented, thus greatly simplifying the investment decision, whereas another one emphasized on the provided transparency and comprehensibility – enabling the client to observe the advisor's actions at any time. Lastly, one participant expressed his attitude as follows: "Why such tools are not already used in the daily business?"

8.7 Discussion

In this essay, we have argued that issues of process, information and cost transparency may be adequately addressed with collaborative and transparent

IT artifacts. Instantiating design principles that have been developed and refined in previous design cycles, we presented how cost transparency may be supported by example of a prototypical tabletop application. We then investigated the efficacy and utility of our cost-transparent design in an experimental evaluation.

Looking at the results, we can see that the cost transparency features of our artifact design indeed improved the clients' understanding and perceived comprehension of costs. Also, we found that cost transparency also influences client-advisor interaction and the client's perception thereof; supporting the client-advisor encounter with a cost-transparent artifact relates to significantly increased client satisfaction with the situation and the advisor as well as increased willingness to pay. Thus, we may maintain all conjectures posed in Section 8.6.1.

Cost transparency. We defined the two main objectives of our designed artifact to (1) provide access to cost information and (2) to comprehensibly represent and include the information into the advisory situation. Based on several generic design principles, we have presented an artifact design that fulfills the first objective by providing shared information spaces, allowing clients to access cost information in the advisory encounter. Regarding the second objective, in our evaluation we could also show that the design also succeeded in providing cost information in a comprehensible way. While the large differences between the settings might seem quite obvious – after all, for the non-transparent setting clients rated their understanding and comprehensibility based on being provided no cost information at all –, also the absolute ratings of the cost-transparent setting's comprehensibility were very high (with mean ratings of 6.00).

Client satisfaction. We have argued that in investment advisory services cost transparency issues may inhibit advisory quality and may lead to client dissatisfaction [Mogicato et al. 2009; Oehler and Kohlert 2009]. Research suggests that clients might not only prefer transparent situations [Camerer and Weber 1992; Carter and Curry 2010], since they are less "ambiguous" and therefore easier to "falsify", but also perceive them as more satisfying [Eggert and Helm 2003]. The results of our evaluation support such notions, showing that the presence of an artifact providing cost information may increase client satisfaction. Indeed, we find significant differences with large effect sizes in the client's ratings of both the advisory session as well as the according advisor – in this regard, it is important to note that the clients' satisfaction with the advisor increased with the cost-transparent setting, i.e.,

their satisfaction was not based on specific characteristics of the advisor but the presence of cost information.

Willingness to pay. Our results clearly support the conjecture that transparency might increase the client's willingness to pay for advice – the evaluation shows that the client's willingness to pay significantly increased in the advisory settings using our cost-transparent artifact. Looking at the large effects regarding the decrease of effective portfolio costs in the transparent setting, the willingness to pay is justified from an economic perspective. However, the client's "social perspective" on pricing [Carter and Curry 2010] might also influence such behavior – from this perspective, the rather high willingness to pay may result from the client rewarding the advisor's transparent and "fair" advice.

The client's willingness to pay may be one fundamental premise for FSPs to abandon today's practice of cross-subsidizing advisory services with product and transaction costs. The participants of our evaluation were indeed willing to pay for the received advisory services, even for the setting that did not feature cost transparency. We cannot, however, estimate possible effects of the IT artifacts on the client's perception – with 10 of 12 participants positively evaluating the artifacts, we cannot rule out positive effects on their willingness to pay for both settings. Furthermore, even though being significantly higher for the cost-transparent setting, the amount clients are willing to pay clearly fails to draw level with the FSP's potential gains from the client's portfolio costs (see Figure 8-12). However, as our conjoint analysis exemplarily shows, the clients might also be willing to pay for advice on a recurring basis (e.g., per hour). Indeed, compared to the advisor's interests and cost transparency of the encounter, clients valued advisory costs as rather unimportant. These preferences are compatible with the participants' reported willingness to pay: clients were willing to pay much higher fees for the encounter that was cost-transparent and thus less asymmetric. Contrary to the FSPs beliefs, this may indicate that the client's willingness to pay is not the main obstacle of alternative business models. Furthermore, given that active clients typically seek advice several times a year, fee-based but transparent advisory models may indeed be economically viable (presuming that in such scenarios cross-subsidization will decrease).

We conclude the discussion with some remarks on potential limitations. While the design principles have been developed and refined in several design iterations, they are general in nature and provide only few implications on their actual implementation in an IT artifact. For example, our artifact's "card" metaphor to allow for comparison of multiple products

is only one of many possibilities to provide such functionality. It is therefore important to acknowledge that each instantiation of an artifact supporting collaborative, (cost) transparent client-advisor interaction may greatly differ in appearance and usability; furthermore, from our experimental evaluation, we may not conclude that our implementation was "optimal" or superior to other potential design instantiations. This also applies to the cost information we decided to implement and visualize – while we were eager to design the information architecture along standard FSPs brochures available to clients, the selection of relevant cost information was subject to our restriction on mutual funds.

Other limitations are related to our evaluation design. We carefully designed our experimental evaluations regarding the test design and its estimated effects based on power analysis and controlled for the influence of advisor/setting combinations by balancing client assignment to the different treatments. We acknowledge, however, that the majority of client participants were students rather than "real" investors. We argue, however, that preference for transparency is a general feature of ambiguity-averse individuals [Andersson and Holm 1998], such that our results may also be applicable to the "population" of investors. Also, we did not find differences between the ratings of experienced clients and their inexperienced counterparts. To be sure, the test setting and the sample size are not qualified to reliably control for such effects – we suggest that further research should investigate possible variances according to such client characteristics.

8.8 Conclusion

In this essay, we have discussed several transparency issues that occur in investment advisory service encounters, putting an emphasis on cost transparency. Building upon tried design principles, we implemented a prototypical IT artifact, exemplarily enabling cost-transparent composition of product portfolios. We evaluated the application's utility and efficacy in experimental evaluations and according to four conjectures. Results show that the artifact's transparent provision of cost information indeed increases the client's perception understanding and comprehension of costs, influences the client's satisfaction with the advisory encounter (and the advisor) as well as relates to significantly increased willingness to pay for the service received. Analogous to similar evaluations [Nussbaumer, P., Matter, I., and Schwabe, G. 2012b], feedback on the IT artifact was very positive, suggesting that IT-supported advisory encounters may be accepted by advisors and clients alike. Clients showed significantly increased satisfaction

with the advisor in the cost-transparent setting, some of them even perceiving him as more competent. Thus, contrary to the popular argumentation of advisors that using IT in client encounters would negatively influence the client-advisor interaction [Schwabe and Nussbaumer 2009], IT might even improve the client's perception of the advisor.

We have motivated this essay from observations of Swiss investment advisory services. However, the design research question of cost transparency and its utility are not limited to the Swiss market. We argue that information and interest asymmetries are general features of investment advisory services – e.g., even fee-based advisory concepts (which are more prevalent outside of Switzerland) may be strained by principal-agent conflicts regarding cost information. Thus, we find that our findings may indeed have general implications for (investment) advisory services also outside of Switzerland.

From our findings, we suggest several such implications for FSP practice of investment advisory service provision. Generally, we argue that for FSPs (cost) transparency should not only take a role in obeying regulations – in fact, they should actively seek realization of transparency as a means of competitive differentiation. In this essay, we have shown how this may be accomplished with IT. Not only are clients increasingly demanding IT support in service encounters [Schwabe and Nussbaumer 2009] but also may IT be key in addressing transparency issues which affect client-advisor interaction and, thereby, advisory quality.

We find that establishing IT-supported transparency may be of value for almost all existing business models of FSPs; for clients seeking "execution only" services, IT may be used to show potential effects of client decisions and ensure their suitability – even though for "execution only" Swiss FSPs are not obliged to perform suitability checks, IT support would allow for such feedback in an efficient way, potentially increasing client satisfaction and retention. We find the greatest potential, however, in the support of "investment advice" encounters. Here IT may provide a common ground of client-advisor interaction and point of reference for their joint decisions. Thereby, IT may not only enable transparency and traceability as requested by regulations but also provide support for the advisor to better *advise* the client and increase comprehension of her investment decisions.

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10 Curriculum Vitae

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